

SPRING FLORA
OF OKLAHOMA

STEMEN AND MYERS

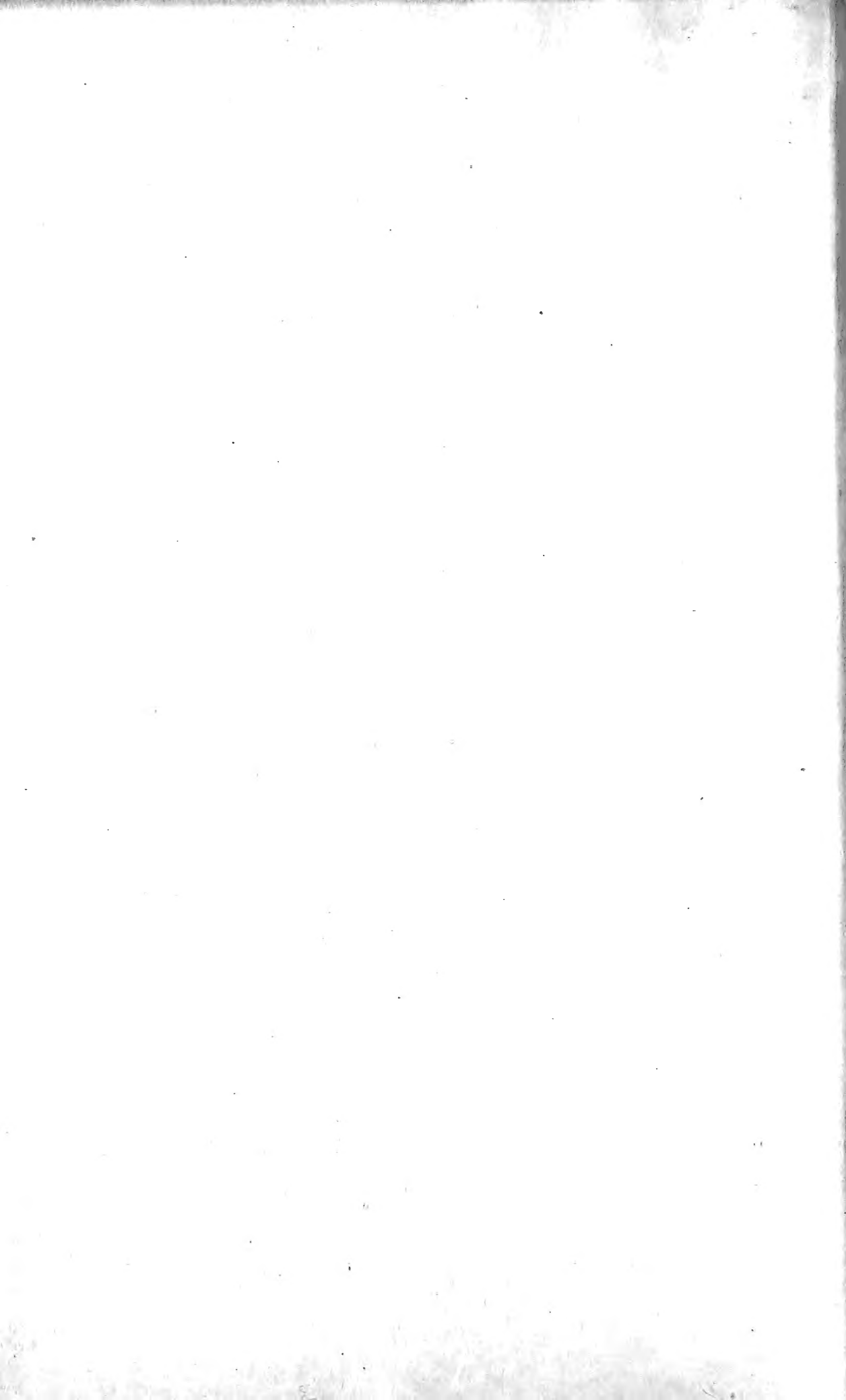


Class QK 181

Book .58

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SPRING FLORA OF OKLAHOMA

WITH KEY

BY

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AND

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FIRST EDITION

HARLOW PUBLISHING COMPANY
Oklahoma City, Oklahoma
1929

QK181
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APR 16 1929

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be / Brown's
Flora of the
Northern States
and Canada

PREFACE

We have felt a need of a Key and Flora of the spring flowering plants of Oklahoma for high school students. This little book has been prepared for the express purpose of fulfilling that need in the authors' biology and botany classes. Although it is especially prepared for high school students, it may be equally useful to more advanced students or anyone interested in the identification of the spring flowers of Oklahoma.

It is our aim to include all of the spring flowering plants of the state. We believe that this Flora is incomplete, but hope that it will serve as a beginning in this field. We would appreciate co-operation of our co-workers in supplying us with specimens of species not listed in this Key and Flora.

We have followed the American Code of Nomenclature.

The species described in this Flora have been collected by the authors from every section of the state, but the regions most thoroughly covered are the south central, the southwestern, western, and especially the central parts of the state.

Following the description of many of the species is given the locality in which they were collected. No doubt, these species will be found in other localities having a similar environment. The usual habitat is also given after each plant description.

There are 90 families, 265 genera, and 476 species included in this Flora.

The following Manuals should be in every school library for ready reference: Britton and Brown's "Illustrated Flora of the Northern States and Canada," Small's "Flora

of the Southeastern United States," and Gray's "New Manual of Botany." The "Illustrated Flora of the Northern States and Canada" is especially valuable because of the illustrations and the synonyms given under each species.

In the preparation of this little book we have been assisted by many persons, to whom we wish to express our thanks. We are especially indebted to the late Dr. A. H. Van Vleet for his assistance in classifying and determining the range of a great many of the species; to Dr. R. E. Jeffs and Dr. Paul B. Sears, who made valuable suggestions; and to Margaret Linn, Lucille Robertson, and Andy Campbell, students in our botany classes at Central High School for preparing the index. Our students have furnished us with specimens collected in many parts of the state.

Oklahoma City, Oklahoma.

THOMAS R. STEMEN,
W. STANLEY MYERS.

February, 1929.

HOW TO USE THE KEY AND FLORA

The purpose of this Key and Flora is to find the names of the spring flowering plants that grow in Oklahoma.

In determining an unknown species, the student should make a careful examination of the plant as a whole, e.g., roots, stem, leaves, and flower, also the fruit and seed if available.

The manner of using the Key and Flora in finding the names of plants will best be learned by following a few examples. Since the Yellow False Garlic (commonly mistaken for Wild Onion) is one of the first to bloom in the spring and one of the most common, we will use this as the first.

Turn to the Key on page v and begin with Class I. Read the paragraph describing it, and, as our plant has its flower parts in sixes and leaves are parallel-veined, we conclude that it belongs under Class I. Read after I; we find that the perianth is free from the ovary; hence, it belongs here. Next read after A, and since it has a perianth, it does not belong here but belongs under B. Read after 1a. We find the stamens are all alike and fertile, so it belongs here. Under 1a there are 2a, 2b; 3a, 3b; 4a, 4b; 5a, 5b. It is evident that our plant belongs to the first of each of these, and thus it is traced to the Liliaceæ Family, page 5. We turn directly to that page and read the description of the family. Finding that our plant conforms to it, we follow the key to the genera in order to find the genus to which it belongs. Here we find two main divisions, "Stem a woody caudex, etc." and "Plants with bulbs and corms." Since the Yellow False Garlic has a bulb it falls under the second division. The flowers of our plant are umbeled, "perianth 6-parted," and "odor not onion-like," therefore it is evidently to be looked for under Genus III. **Nothoscordum**. Turn to page 7, and read the description of this genus. Our plant agrees with this description. We read the description of the species and find that the plant belongs here. Thus, the scientific name is **Nothoscordum bivalve** (L.) Britton, and the common name is YELLOW FALSE GARLIC. L. is the abbreviation for Linnæous (botanist). Linnæous and Britton are the authorities for the scientific name of this plant.

For our next example, we will take the CAROLINA ANEMONE, which also blooms early in the spring. Now turn to the Key to the Families. Clearly, it belongs to Class II, Dicotyledons. After reading paragraph I on page v and paragraph II on page xiii, we find that it belongs under I, since the flower has a perianth of similar segments. Read after A on page v, and after B on page xi. It is evident from the description given here that it belongs under the B. Under this heading there are two general groups, "Trees, shrubs, or woody climbers" and "Herbs or herbaceous vines." Since this plant is an herb, it belongs under the second heading, "Herbs or herbaceous vines." The next choice is "Flowers partly or completely epigynous" or "Flowers hypogynous." This flower is hypogynous. The families with hypogynous perianths are grouped under two divisions and of these the second, with its "Carpels free or only united at the base," corresponds to our specimen. Under this division there are two families and our specimen having many **distinct** carpels traces to **Family 25 Ranunculaceæ**, page 44. Turning to the key to the genera of the Crowfoot Family, page 44, it is found that our specimen falls under the second main heading, "Carpels one-ovuled, etc." The plant having flowers subtended by involucre, traces to the Genus **Anemone**, page 46. After reading the description of the genus to be sure that no mistakes thus far have been made, read the key to the species. Since the "Involucre is mostly below the middle of the scape," it is therefore **Anemone caroliniana** Walt. The name was given it by Thomas Walter, as indicated by the abbreviation Walt. following it.

° is used to indicate feet.

' is used to indicate inches.

" is used to indicate lines or twelfths of an inch.

1 line (1") is equivalent to approximately 2 millimeters.

The measurements have been given in feet, inches and lines. A ruler divided into twelfths of an inch will be found at the bottom of page xvi for the student's convenience.

ANALYTICAL KEY TO THE FAMILIES DESCRIBED IN THIS FLORA

Class I. MONOCOTYLEDONS.

Flowers usually with their parts in threes or sixes, never in fives.
Leaves mostly parallel-veined. Embryo with a single cotyledon.

I. Perianth free from the ovary or wanting.

A. Perianth wanting, or of scale-like or bristle-form divisions.

1. **ARACEÆ.** 1

B. Perianth present, herbaceous or colored, never scale-like nor bristle-form.

1a. Stamens all alike and fertile.

2a. Flowers perfect; plants not climbing.

3a. Divisions of the perianth alike or nearly so.

4a. Styles united, often short, or rarely wanting.

5a. Plants with bulbs, corms, erect rootstocks, or caudices, or bundles of fleshy roots.

4. **LILIACEÆ.** 5

5b. Plants with elongated horizontal rootstocks.

5. **CONVALLARIACEÆ.** 9

4b. Styles distinct. 3. **MELANTHACEÆ.** 4

3b. Divisions of the perianth unlike (3 green sepals and 3 colored petals); leaves linear and the flowers in umbels.

2. **COMMELINACEÆ.** 2

2b. Flowers diœcious; plants scrambling or climbing.

6. **SMILACEÆ.** 10

1b. Stamens unlike, or only 3 with fertile anthers.

2. **COMMELINACEÆ.**

II. Perianth present, adnate to the ovary.

Stamens 6. 7. **AMARYLLIDACEÆ.** 12

Stamens 3; leaves 2-ranked, equitant. 8. **IRIDACEÆ.** 14

Class II. DICOTYLEDONS.

Flowers usually with their parts in fives or fours. Leaves mostly netted-veined. Embryo with two cotyledons.

I. Corolla when present choripetalous (petals distinct); perianth none, or of similar segments or divided into calyx and corolla; sepals, petals, and stamens sometimes on a disk or hypanthium.

A. Calyx and corolla both present, calyx may be minute.

1a. Flowers hypogynous or perigynous; ovary free from the calyx.

- 2a. Stamens numerous, at least more than 10 and more than twice the petals.
- 3a. Carpels more than 1, distinct, or only slightly adherent with each other.
- 4a. Stamens inserted on the receptacle.
- 5a. Stamen filaments much shorter than the anthers; perianth 3-parted; leaves entire, alternate, without stipules, 2-ranked.
 - 24. ANONACEÆ.** 43
- 5b. Stamen filaments longer than the anthers; flowers perfect; herbs; or climbers with opposite leaves.
 - 25. RANUNCULACEÆ.** 44
- 4b. Stamens distinct, inserted on the perigynous disk, with the calyx; leaves alternate, usually with stipules.
 - 34. ROSACEÆ.** 61
- 3b. Carpels 1 or more, united, but styles and stigmas may be several.
- 4a. Ovary simple, 1-celled, placenta 1 parietal, many-ovuled or two-ovuled.
- 5a. Leaves ternately compound or dissected; herbs.
 - 25. RANUNCULACEÆ.** 44
- 5b. Leaves simple: trees or shrubs with 1-seeded drupes.
 - 35. AMYGDALACEÆ.** 63
- 4b. Ovary compound, 1-celled with 2 or more parietal placenta.
 - 26. PAPAVERACEÆ.** 48
- 4c. Ovary compound, many-celled.
- 5a. Herbs.
 - 6a. Sepals 5; petals many, which may be small and glandular; leaves alternate, finely dissected.
 - 25. RANUNCULACEÆ.** 44
 - 6b. Calyx persistent, stamens united by their filaments into a tube; leaves alternate, palmately-veined, with stipules.
 - 57. MALVACEÆ.** 108
 - 6c. Inflorescence usually a cyathium; leaves opposite, alternate or verticillate; ovary 3-celled with 1 or 2 ovules in each cavity; styles 3.
 - 46. EUPHORBIACEÆ.** 89
 - 56. TILIACEÆ.** 107
- 2b. Stamens of the same number as the petals and opposite them.
- 3a. Monœcious or diœcious herbs; ovary mostly 3-celled with 3 simple or cleft styles.
 - 46. EUPHORBIACEÆ.** 89
- 3b. Perfect.
- 4a. Ovary 2-5 celled.

- 5a. Woody vines climbing by tendrils.
 - 55. **VITACEÆ.** 104
- 5b. Shrubs.
 - 54. **RHAMNACEÆ.** 103
- 4b. Ovary 1-celled.
 - 5a. Style and stigma 1, fruit a capsule; herbs with simple leaves.
 - 65. **PRIMULACEÆ.** 127
 - 5b. Style 1, stigmas 2-3, sepals 2, fruit a capsule; leaves succulent.
 - 21. **PORTULACACEÆ.** 39
- 2c. Stamens not more than twice as many as the petals; when of the same number as the petals, alternate with them.
- 3a. Carpels 2 or more, distinct or sometimes united at the base.
- 4a. Shrubs or trees.
 - Leaves punctate with transparent dots, alternate.
 - 44. **RUTACEÆ.** 87
- 4b. Herbs.
 - 5a. Stamens distinct.
 - 6a. Carpels as many as the sepals or petals.
 - 29. **CRASSULACEÆ.** 58
 - 6b. Carpels fewer or more than the sepals or petals.
 - 34. **ROSACEÆ.** 61
 - 5b. Stamens united; plants with milky sap.
 - 71. **ASCLEPIADACEÆ.** 135
- 3b. Carpels 1 or more, united.
 - 4a. Carpels 1, ovary with 1 parietal placenta; leaves alternate, usually with stipules, usually compound.
 - 5a. Fruit spiny, indehiscent; leaves simple, exstipulate.
 - 38. **KRAMERIACEÆ.** 70
 - 5b. Fruit a legume; leaves 2-3 pinnate; flowers regular.
 - 36. **MIMOSACEÆ.** 64
 - 5c. Fruit a legume, sometimes prickly; upper petal inclosed by the lateral ones in the bud; leaves simple or compound, mostly with stipules.
 - 37. **CÆSALPINIACEÆ.** 67
 - 5d. Fruit a legume or loment, upper petal inclosing the lateral ones in the bud; leaves compound with stipules.
 - 39. **FABACEÆ.** 70
 - 4b. Carpels more than 1, as shown by the compound ovary, cavities, placentæ, styles, or stigmas.
 - 5a. Ovary 1-celled.
 - 6a. Corolla regular or nearly so.
 - 7a. Ovules several or many, on 2 or more parietal placentæ.
 - 59. **PASSIFLORACEÆ.** 113
 - 7b. Ovules solitary or on a central placenta in the bottom of the cavity.
 - 8a. Leaves alternate.

- 9a. Ovules solitary, stigmas 3; shrubs; leaves ex-stipulate.
 - 47. **ANACARDIACEÆ.** 95
- 9b. Ovules solitary or few; herbs having leaves without stipules.
 - 28. **CRUCIFERÆ.** 50
- 9c. Ovules 2 or more; sepals 2; herbs with fleshy leaves. 21. **PORTULACACEÆ.** 39
- 8b. Leaves opposite.
 - 9a. Petals not united with the calyx; herbs with opposite entire leaves; stems usually swollen at the joints.
 - 10a. Sepals distinct; ovary sessile.
 - 22. **ALSINACEÆ.** 40
 - 10b. Sepals united; ovary stipitate.
 - 23. **CARYOPHYLLACEÆ.** 43
 - 9b. Petals united with the calyx; herbs mostly with opposite, entire leaves and no stipules.
 - 61. **LYTHRACEÆ.** 114
 - 9c. Petals free, sepals 2; herbs with fleshy leaves.
 - 21. **PORTULACACEÆ.** 39
- 6b. Corolla irregular.
 - 7a. Corolla zygomorphic; petals and stamens 5; herbs with alternate or opposite stipulate leaves.
 - 58. **VIOLACEÆ.** 110
 - 7b. Corolla irregular; petals 4; stamens 6, sepals 2, minute, herbs, usually with alternate leaves with stipules.
 - 27. **FUMARIACEÆ.** 49
- 5b. Ovary 2-celled to many-celled.
 - 6a. Corolla irregular.
 - 7a. Trees or shrubs with opposite, palmately-compound leaves; ovary 3-celled.
 - 52. **ÆSCULACEÆ.** 102
 - 7b. Herbs, or somewhat shrubby plants, with simple leaves.
 - 8a. Stamens 6-8; ovary 2-celled, 2-ovuled.
 - 45. **POLYGALACEÆ.** 88
 - 8b. Stamens 11-12; ovary 2-6 celled.
 - 61. **LYTHRACEÆ.** 114
 - 6b. Corolla regular or nearly so.
 - 7a. Stamens neither just as many nor twice as many as the petals.
 - 8a. Stamens 6, four long and two short; petals 4.
 - 28. **CRUCIFERÆ.** 50

- 8b. Stamens distinct and fewer than the 4 petals;
trees or shrubs with opposite, pinnate or
simple leaves.
 - 67. OLEACEÆ.** 130
- 8c. Stamens about 8, shrubs or trees with palmate-
ly-veined, opposite leaves, fruit a samara.
 - 51. ACERACEÆ.** 100
- 7b. Stamens just as many or twice as many as the
petals.
 - 8a. Ovules and seeds 1 or 2 in each cavity.
 - 9a. Herbs usually with milky sap; flowers mon-
œcious or diœcious.
 - 46. EUPHORBIACEÆ.** 89
 - 9b. Herbs without milky sap; flowers actin-
omorphic and perfect.
 - 10a. Cavities of the ovary as many as the
sepals; leaves with stipules.
 - 40. GERANIACEÆ.** 82
 - 10b. Cavities of the ovary twice as many as
the sepals; leaves without stipules.
 - 42. LINACEÆ.** 84
 - 9c. Shrubs, trees, woody climbers, or herbaceous
vines.
 - 10a. Leaves pinnately-veined, simple, not punc-
tate.
 - 11a. Calyx minute, fruit a berry-like drupe;
trees or shrubs with simple, mostly
alternate leaves.
 - 48. ILICACEÆ.** 98
 - 11b. Calyx not minute; pod colored, dehis-
cent; seeds inclosed in a pulpy aril.
 - 49. CELASTRACEÆ.** 99
 - 10b. Leaves pinnately-compound, alternate;
trees, with a globose or lobed berry.
 - 53. SAPINDACEÆ.** 103
 - 10c. Leaves palmately-veined or pinnately-
compound; fruit winged.
 - 51. ACERACEÆ.** 100
 - 8b. Ovules and seeds 3-5 in each cavity; annual,
more or less prostrate herbs with pinnate
leaves. **43. ZYGOPHYLLACEÆ.** 86
 - 8c. Ovules and usually seeds many or several in
each cavity.
 - 9a. Stipules none when the leaves are opposite.
 - 10a. Stamens 10, slightly united at the base;

- leaflets 3, inversely heart-shaped; herbs with sour sap.
- 41. OXALIDACEÆ.** 83
- 10b. Stamens distinct, not on an hypanthium. Styles 2-5, distinct; herbs with opposite, entire leaves, the stems usually with swollen joints.
- 23. CARYOPHYLLACEÆ.** 43
- 10c. Stamens distinct, on an hypanthium or disk. Style 1, pod in the hypanthium, 1-6 celled.
- 61. LYTHRACEÆ.** 114
- 9b. Stipules between the opposite, trifoliate leaves, caducous; shrubs or small trees.
- 50. STAPHYLEACEÆ.** 100
- 2d. Stamens 5-60; fleshy herbs with succulent, entire leaves; carpels united.
- 21. PORTULACACEÆ.** 39
- 1b. Flowers epigynous; calyx above the ovary.
- 2a. Ovules and seeds more than one in each cavity of the ovary.
- 3a. Ovary 1-celled.
- 4a. Herbs with rough or stinging pubescence; leaves alternate and exstipulate; stamens numerous.
- 60. LOASACEÆ.** 114
- 4b. Shrubs; petals 4 or 5; fruit a pulpy berry.
- 32. GROSSULARIACEÆ.** 60
- 4c. Herbs with glabrous, succulent, entire leaves; styles 3-8.
- 21. PORTULACACEÆ.** 39
- 3b. Ovary 2-celled to many celled.
- 4a. Herbs or herbaceous vines; stamens 4 or 8; style 1.
- 62. ONAGRACEÆ.** 115
- 4b. Trees, shrubs, or woody climbers.
- 5a. Stamens 4 or 8, style 1; stipules none.
- 62. ONAGRACEÆ.** 115
- 5b. Stamens 4 or 5; ovary 4-5 celled; stipules fugacious.
- 49. CELASTRACEÆ.** 99
- 5c. Stamens 8-40; shrubs, trees, or woody vines; ovary 2-many celled.
- 30. HYDRANGEACEÆ.** 59
- 2b. Ovules and seeds only 1 in each cavity of the ovary.
- 3a. Herbs.
- 4a. Stamens 2 or 8, style 1, stigma 2-4 lobed.
- 62. ONAGRACEÆ.** 115
- 4b. Stamens 5, fruit dry, styles 2; flowers in umbels.
- 63. AMMIACEÆ.** 120
- 3b. Shrubs or trees.
- 4a. Stamens 4 or 5, style and stigma 1.
- 64. CORNACEÆ.** 126

4b. Stamens 2 or 8, style 1, stigma 2-4 lobed.

62. **ONAGRACEÆ.** 115

B. Only the calyx present, sepals distinct or united, green or colored.

1a. Trees, shrubs, or woody climbers.

2a. Leaves opposite or whorled.

3a. Not climbing.

4a. Trees or shrubs with pinnate leaves and fruit a samara, or leaves simple with fruit a drupe.

67. **OLEACEÆ.** 130

4b. Trees with a 2-celled ovary, forming a 2-winged, 2-seeded fruit.

51. **ACERACEÆ.** 100

4c. Shrubs parasitic on trees.

15. **LORANTHACEÆ.** 33

3b. Climbing, more or less woody vines; stamens numerous; achenes with long, persistent styles.

25. **RANUNCULACEÆ.** 44

2b. Leaves alternate.

3a. Leaves compound.

4a. Trees with odd-pinnate leaves; fruit a nut inclosed in a husk.

9. **JUGLANDACEÆ.** 16

4b. Shrubs or trees with pinnate or trifoliate, punctate leaves.

44. **RUTACEÆ.** 87

4c. Trees or shrubs with compound leaves, evenly pinnate or bi-pinnate.

39. **FABACEÆ.** 70

3b. Leaves simple.

4a. Trees; flowers in dense, spherical heads, the pistillate on a long, slender peduncle; twigs with stipular rings.

33. **PLATANACEÆ.** 61

4b. Twigs not with stipular rings.

5a. Flowers epigynous; stamens 5-15; ovary 1-celled.

64. **CORNACEÆ.** 126

5b. Flowers hypogynous.

6a. At least one kind of flowers in aments or ament-like clusters; fruit a nut with a bur or cup; or more or less fleshy and aggregate.

7a. Sap milky, fruit aggregate and fleshy, flowers in ament-like spikes or heads.

14. **MORACEÆ.** 31

7b. Sap not milky, fruit a large or small nut.

8a. Fruit a nut with a bur or cup.

12. **FAGACEÆ.** 22

8b. Fruit a small nut, flowers in aments.

11. **BETULACEÆ.** 21

6b. Flowers not in aments.

- 7a. Trees with pinnately-veined, 2-ranked leaves, fruit a samara, drupe or small nut.
13. ULMACEÆ. 29
- 7b. Trees with 2-ranked leaves having 2 prominent side ribs, fruit aggregate.
14. MORACEÆ. 31
- 7c. Trees or shrubs; leaves not 2-ranked.
 8a. Flowers with 4-5 perigynous stamens alternate with sepals; stigmas 2-5, fruit a drupe.
54. RHAMNACEÆ. 103
- 8b. Flowers with a 4-5 parted calyx, with a similar number of stamens in the staminate ones; sap milky.
14. MORACEÆ. 31
- 1b. Herbs or herbaceous vines.
 5a. Flowers partly or completely epigynous.
 6a. Low herbaceous perennials, parasitic on roots; flowers in umbel-like clusters; ovary 1-celled.
16. SANTALACEÆ 33
- 6b. Perennial herbs with axillary flowers; 4 stamens; capsule 4-celled.
62. ONAGRACEÆ. 115
- 5b. Flowers hypogynous.
 6a. Carpels 1-several, always united.
 7a. Fruit a capsule; leaves opposite or whorled, or, if alternate, then usually with milky or colored sap.
 8a. Herbs with opposite or whorled leaves without stipules; capsule 2-several celled.
20. AIZOACEÆ. 38
- 8b. Herbs with opposite, entire leaves, usually with swollen joints; ovary 1-celled.
 9a. Calyx of distinct sepals.
22. ALSINACEÆ. 40
- 9b. Calyx of united sepals.
23. CARYOPHYLLACEÆ. 43
- 8c. Herbs with opposite, alternate, or verticillate leaves and usually with milky sap; ovary 2-3 celled. **46. EUPHORBIACEÆ.** 89
- 7b. Fruit an achene, utricle, or fleshy berry; leaves alternate, opposite, or whorled; sap never milky.
 8a. Herbs or twining vines with swollen joints and sheathing stipules; fruit an achene.
17. POLYGONACEÆ. 34
- 8b. Stipules where present not sheathing.

- 9a. Herbs with a colored calyx like a sympetalous corolla; stems with tumid joints; fruit an anthocarp.
19. NYCTAGINACEÆ. 37
- 9b. Herbs with a calyx not corolla-like; fruit a utricle.
18. CHENOPODIACEÆ. 37
- 6b. Carpels free or only united at the base.
 7a. Carpels several-many, distinct, not enclosed; stamens numerous.
25. RANUNCULACEÆ. 44
- 7b. Carpels 1-4 enclosed in the perigynous disk; leaves simple or compound with stipules.
34. ROSACEÆ. 61
- C. Perianth none; sometimes a minute border, cup, or gland may represent the calyx.
- 1a. Herbs with milky sap. **46. EUPHORBIACEÆ. 89**
- 1b. Trees or shrubs.
 2a. Leaves opposite. **67. OLEACEÆ 139**
 2b. Leaves alternate.
 3a. Leaves star-shaped, fragrant.
31. ALTINGIACEÆ. 59
- 3b. Leaves not star-shaped; flowers imperfect.
 4a. Ovary 1-celled, many-seeded; seeds with a tuft of cottony hairs. **10. SALICACEÆ. 18**
- 4b. Ovary 2-celled; pistillate flowers 2 or more in each bract of the ament or head.
11. BETULACEÆ. 21
- II. Corolla sympetalous (petals more or less united); perianth composed of calyx and corolla, calyx may be minute or suppressed.
- A. Flowers hypogynous.
- 1a. Stamens free from the corolla, as many as the petals and alternate with them or twice as many or more.
- 2a. Styles 2, distinct with united stigma; plants with milky sap and entire leaves, usually opposite or whorled.
71. ASCLEPIADACEÆ. 135
- 2b. Choripetalous plants in which the petals are sometimes partly or completely united.
- 3a. Ovary 1-celled with 1 parietal placenta; leaves alternate, usually compound. **39. FABACEÆ. 70**
- 3b. Ovary 1-celled; calyx like a sympetalous colored corolla; stems with tumid joints.
19. NYCTAGINACEÆ. 37
- 3c. Ovary 2-celled with a single ovule in each cavity; herbs.
45. POLYGALACEÆ. 88

- 3d. Ovary 5-celled, 5 styles; stamens 5 long and 5 short, somewhat united below; herbs.
41. OXALIDACEÆ. 83
- 3e. Ovary 4-8 celled, one ovule in each cavity; fruit a berry-like drupe; trees or shrubs.
48. ILICACEÆ. 98
- 3f. Ovary 3-celled; herbs with milky sap.
46. EUPHORBIACEÆ. 89
- 1b. Stamens more or less united with the corolla, as many as the petals and opposite them or twice as many more.
 3a. Stamens twice as many as the lobes of the corolla or more; styles 2-8; plants mostly monœcious or diœcious; leaves alternate and entire.
66. EBENACEÆ. 129
- 3b. Stamens twice as many as the lobes of the corolla; style one; leaves compound.
39. FABACEÆ. 70
- 3c. Stamens as many as the lobes of the corolla.
 4a. Style and stigma 1; herbs; fruit a capsule.
65. PRIMULACEÆ. 127
- 4b. Stigma 1; shrubs or trees; leaves serrate or spiny, alternate and simple.
48. ILICACEÆ. 98
- 1c. Stamens united with the corolla or only united at the base, as many as the petals or fewer and alternate with them.
 3a. Corolla not scarious, usually nerved.
 4a. Carpels 2, distinct below.
 5a. Styles and stigmas united, sap milky, stamens distinct.
70. APOCYNACEÆ. 134
- 5b. Styles distinct, stigmas united; stamens mostly united.
71. ASCLEPIADACEÆ. 135
- 4b. Carpels united forming a compound ovary.
 5a. Fertile stamens as many as the lobes of the corolla.
 6a. Ovary 2-many celled, sometimes deeply 4-lobed.
 7a. Leaves alternate, chiefly rough herbs; ovary 4-lobed.
75. BORAGINACEÆ. 144
- 7b. Leaves opposite; if alternate, the ovary not 4-lobed.
 8a. Ovary 4-lobed around the style and separating into 1-seeded nutlets at maturity; mostly herbs with square stems.
 9a. Ovary not deeply lobed; usually not aromatic.
76. VERBENACEÆ. 148
- 9b. Ovary deeply 4-lobed around the style; aromatic.
77. LABIATÆ. 150

- Sb. Ovary not 4-lobed and not separating into 1-seeded nutlets at maturity.
- 9a. Corolla more or less irregular; ovary 2-celled.
79. SCROPHULARIACEÆ. 161
- 9b. Corolla regular or nearly so.
- 10a. Ovary 3-celled; stigmas 3. linear herbs.
73. POLEMONIACEÆ. 140
- 10b. Ovary 3-many celled; stigma 1; shrubs or trees.
48. ILICACEÆ. 98
- 10c. Ovary 2-celled; sometimes 3-4 celled; styles 1-3, more or less united; mostly vines.
72. CONVULVULACEÆ. 138
- 10d. Ovary 2-celled; sometimes 3-5 celled; carpels several-many seeded; leaves usually alternate.
78. SOLANACEÆ. 156
- 10e. Ovary 2-celled; style simple or 2-lobed, sometimes 4-lobed; leaves stipulate, opposite or verticillate.
68. LOGANIACEÆ. 132
- 6b. Ovary 1-celled.
- 7a. Ovary forming a many-seeded capsule; smooth herbs with sessile, opposite leaves, rarely verticillate or alternate.
69. GENTIANACEÆ. 133
- 7b. Ovary forming a few-seeded capsule; herbs usually hairy, with alternate or, rarely, opposite leaves.
74. HYDROPHYLLACEÆ. 141
- 5b. Fertile stamens fewer than the lobes of the corolla.
- 6a. Corolla zygomorphic.
- 7a. Ovules several-many; the ovary not forming 1-seeded nutlets.
- 8a. Trees, shrubs, or woody vines; seeds winged.
80. BIGNONIACEÆ. 166
- 8b. Herbs or rarely trees; placentæ axile; seeds not on hooks.
79. SCROPHULARIACEÆ. 161
- 8c. Herbs with opposite simple leaves; placentæ parietal; seeds few, supported on hooks.
81. ACANTHACEÆ. 167
- 7b. Ovules 2-4; the ovary forming 1-seeded nutlets.
- 8a. Ovary not lobed, the style apical.
76. VERBENACEÆ. 148

8b. Ovary 4-lobed around the style; herbs usually with aromatic leaves.

77. LABIATÆ. 150

6b. Corolla regular; trees or shrubs with opposite leaves.

67. OLEACEÆ. 130

3b. Corolla scarious, nerveless; herbs with small flowers in spikes or heads.

82. PLANTAGINACEÆ. 168

B. Flowers epigynous.

1a. Flowers not in involucrate heads.

2a. Leaves alternate.

3a. Vines with tendrils; flowers monœcious or diœcious; leaves palmately lobed or veined; stamens 3 or less.

86. CUCURBITACEÆ. 177

3b. Herbs with milky sap, not vines; flowers regular; stamens 5.

87. CAMPANULACEÆ. 178

3c. Herbs with milky sap, not vines; flowers irregular; stamens 5.

88. LOBELIACEÆ. 180

2b. Leaves opposite or whorled.

3a. Stamens 1-3, fewer than the lobes of the corolla; ovary 1-celled with 1 ovule or 3-celled with 2 empty cavities; leaves without stipules.

85. VALERIANACEÆ. 176

3b. Stamens as many as the lobes of the corolla; leaves with stipules or in whorls without apparent stipules.

83. RUBIACEÆ. 171

3c. Stamens as many as the lobes of the corolla; leaves usually without stipules.

84. CAPRIFOLIACEÆ. 173

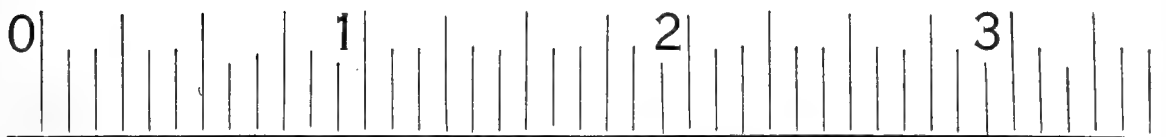
1b. Flowers in involucrate heads; ovary 1-celled.

2a. Flowers all ligulate; sap milky.

89. CHICORIACEÆ. 180

2b. Flowers all tubular; or the outer expanded into rays; stamens united by their anthers into a tube around the style; sap very rarely milky.

90. COMPOSITÆ. 185



Spring Flora of Oklahoma

CLASS 1. Monocotyledonous Plants.

Stems with the woody fiber and vessels in bundles or threads, which are irregularly imbedded in pithy tissue. Leaves mostly parallel-veined and sheathing at the base, alternate, nearly always entire. Parts of the flowers commonly in 3's. Embryo with one cotyledon.

FAMILY 1. ARACEÆ. ARUM FAMILY.

Herbs with long-petioled, simple or compound leaves, rising from a corm or tuberous root; sap acrid or pungent. Flowers crowded on a spadix which is usually surrounded by a spathe. Perianth wanting, or of 4-6 scale-like segments. Fruit usually a berry.

ARISÆMA Martius.

Perennial herbs, springing from a corm or a tuberous rootstock. Leaves deeply divided, rising on long petioles, and sheathing the base of the simple scape. Spathe rolled up at base. Summit of spadix naked, the lower part flower-bearing; staminate flowers above, pistillate ones below. Stigma flat; ovary 1-celled; berry 1-few-seeded.

Spathe hooded, open at the throat, enclosing the spadix.

1. *A. triphyllum*.

Spathe convolute; summit of the spadix exerted.

2. *A. Dracontium*.

1. **Arisæma triphyllum** (L.) Torr. JACK-IN-THE-PULPIT. INDIAN TURNIP. Leaves 3-foliate with elliptical-ovate, pointed segments. Spathe green with purple stripes, broad and overhanging at the summit. Corm turnip-like, but much wrinkled, very starchy, and filled with intensely burning juice.

In moist woods. Oklahoma and Cleveland counties. May-July.

2. **Arisæma Dracontium** (L.) Schott. GREEN DRAGON. DRAGON-ROOT. Leaf usually single, divided into 5-17 rather narrow-pointed

leaflets; spadix tapering to a long, slender point, often bearing fully developed staminate and pistillate flowers.

In moist, rich woods and along streams. Frequent in eastern half of state.

FAMILY 2. COMMELINACEÆ. SPIDERWORT FAMILY.

Herbs, with fibrous or sometimes thickened roots, jointed and often branching, leafy stems. Leaves simple, succulent, narrow, entire, sheathing at the base, sheaths entire or split. Flowers in terminal cymes or umbels, perfect, often irregular. Sepals 3, persistent, herbaceous or colored. Petals 3, soon falling or liquefying; stamens usually 6, often some of them imperfectly developed. Ovary 2-3-celled; style single, stigma entire or 3-lobed, fruit a 2-3-celled, 2-3-valved capsule, seeds solitary or several in each cell.

Cymes subtended by small or minute bracts very unlike the leaves.

I. Cuthbertia.

Cymes subtended by an involucre of 1-3 bracts similar to the leaves.

II. Tradescantia.

I. CUTHBERTIA Small.

Perennial herbs, with mostly tufted stems. Leaves alternate, blades very narrow and elongated. Cymes umbel-like, solitary at the ends of long peduncles, and subtended by very small bracts unlike the leaves. Sepals 3. Petals 3, reddish, pink or rose-purple, distinct. Stamens 6; filaments pubescent.

1. Cuthbertia graminea Small. GRASS-LIKE SPIDERWORT. Stems erect, 2'-8' tall, densely tufted, sometimes 100 or more together, commonly simple, slightly zigzag. Leaves numerous; blades narrowly linear or linear-filiform, 4'-6' long, acute, mostly erect; sheaths ciliate; cymes 3-15-flowered, simple; corollas pink or rose-colored, 5"-10" broad.

Sandy soil. Oklahoma and Cleveland counties. April-August.

II. TRADESCANTIA L.

Perennials. Stems mucilaginous, mostly upright, leafy. Leaves keeled. Flowers lasting for only one day, in umbel-like clusters, axillary and terminal, produced through the summer. Flowers regular. Sepals herbaceous. Petals all alike, ovate, sessile. Stamens all fertile; filaments bearded.

Stems 1' to rarely 4' long; bracts longer than the leaves. 1. *T. brevicaulis*.

Stems elongated, 4'-3' long; bracts mostly shorter than the leaves.

Foliage bright green; pedicels, like the sepals, pilose or villous.

Pedicels and sepals pilose with gland-tipped hairs. 2. *T. occidentalis*.

Pedicels and sepals villous with non-glandular hairs. 3. *T. virginiana*.

Foliage glaucous; pedicels glabrous; sepals with a tuft of hairs at the apex. 4. *T. reflexa*.

1. **Tradescantia brevicaulis** Raf. SHORT-STEMMED SPIDERWORT. Often appearing nearly stemless, very hairy. Roots a cluster of dark thickened fibers. Leaves lance-linear. Sepals ovate-lanceolate. Corolla about 1' broad, blue or rose-purple.

Sandy soil. Specimens collected near Enid and Sulphur. April-May. Easy to transplant.

2. **Tradescantia occidentalis** (Britton) Smyth. WESTERN SPIDERWORT. Slender, bright green, erect, 1'-2½' tall. Leaves narrowly linear, involute, their bases often enlarged. The bracts scarcely if at all broader than the leaves. Sepals glandular-pubescent. Petals blue or reddish, almost 5" long.

Common on sandy soil. May-August. Easily transplanted.

3. **Tradescantia virginiana** L. SPIDERWORT. Glabrous or slightly pubescent, succulent, glaucous or green, stems stout, 8'-3° tall. Bracts leaf-like, elongated, usually ascending. Petals rich purple-blue, 6'-1° long.

Woods and prairies. Oklahoma County. April-August.

4. **Tradescantia reflexa** Raf. REFLEXED SPIDERWORT. Perennial, glabrous, glaucous. Stems erect, 1°-3° tall, nearly straight, commonly

much-branched. Leaves linear, straight or somewhat curved, long-attenuate. Narrow bracts and glabrous pedicels soon deflexed. Sepals ovate-lanceolate, 4"-5" long. Petals blue.

Sandy or clayey soil. Oklahoma and Cleveland counties. Easily transplanted.

FAMILY 3. MELANTHACEÆ. BUNCH FLOWER FAMILY.

Leafy-stemmed perennials, with rootstocks or solid bulbs. Flowers racemose or paniculate, perfect, diœcious, or polygamous. Petals and sepals each 3, distinct or nearly so. Stamens 6; filaments often nearly adnate to the base of the sepals and petals; anthers versatile. Pistil of three united carpels; ovary 3-celled; styles 3. Fruit a septicidal capsule.

Plants bulbous, perianth segments with one gland.

Ovary partly inferior; gland obcordate. **I. Anticlea.**

Ovary wholly superior; gland obovate or half-orbicular. **II. Toxicoscordion.**

I. ANTICLEA Kunth.

Glabrous, perennial herbs, with membranous-coated bulbs, leafy stems, and rather large, greenish or yellowish-white flowers in terminal racemes. Leaves linear. Flowers perfect. Perianth withering-persistent, adnate to the lower part of the ovary, its segments bearing a single obcordate gland. Stamens free. Capsule 3-celled. Seeds numerous.

1. **Anticlea elegans** (Pursh.) Rydb. GLAUOUS ANTICLEA. Plant glaucous. Bulb ovoid, about 1' long, its coat membranous. Stem 6'-3° tall. Leaves 2"-7" wide; 4'-12' long. Bracts ovate-lanceolate, often membranous-margined. Flowers racemose or paniculate, dirty white; petals and sepals oval or obovate, obtuse. Capsule ovoid.

In moist soil. Collected by A. H. Van Vleet. May-August.

II. TOXICOSCORDION Rydb.

Glabrous, poisonous, perennial herbs, with membranous-

coated bulbs, narrowly linear leaves folded together lengthwise and small, perfect, or polygamous flowers in racemes or panicles. Petals and sepals bearing an obovate or semi-orbicular gland at or above the base of the blade. Ovary wholly superior. Stamens more or less adnate to the base of the petals and sepals. Anthers subreniform. Ovary 3-celled. Capsule 3-beaked, containing numerous seeds.

1. **Toxicoscordion Nuttallii** (A. Gray) Rydb. NUTTALL'S CAM-ASS. Light green, scarcely glaucous, stem 12'-24' high. Bulb large, coated. Leaves 3"-8" wide, shorter than the stem, strongly conduplicate, the upper very short. Bracts membranous, scarious, shorter than the slender pedicels.

Prairies. May-June. Oklahoma County.

FAMILY 4. LILIACEÆ. LILY FAMILY.

Mostly herbs. Flowers regular and symmetrical. Perianth free from the ovary. Stamens nearly always 6, one before each division of the perianth. Ovary usually 3-celled. Fruit a pod or berry, few-many-seeded. In our species the divisions of the perianth are colored nearly alike.

Stem a woody caudex; leaves rigid, mostly bearing marginal flowers.

1. **Yucca.**

Plants with bulbs or corms.

Flowers umbeled.

Perianth 6-parted.

Odor characteristically onion-like. II. **Allium.**

Odor not onion-like. III. **Nothoscordum.**

Perianth funnel-form, the tube about as long as the lobes.

IV. **Androstephium.**

Flowers solitary.

Leaves only 2, appearing basal; flowers bractless.

V. **Erythronium.**

I. YUCCA L.

Plants with woody and leafy stems, or short caudex. Leaves linear or lanceolate, usually rigid and sharp-pointed, bearing long, marginal thread-like fibers. Flowers large, bracted, nodding in terminal raceme or panicle. Perianth bell-shaped, or nearly globular, greenish-white, 6 ovate or ovate-lanceolate separate segments. Stamens hypogynous, shorter than the perianth, filaments thickened above, often papillose. Anthers small. Ovary sessile, 3-celled, or becoming 6-celled, 3-angled, many-ovuled. Fruit an oblong, 3-angled, many seeded, dehiscent capsule.

1. *Yucca glauca* Nutt. BEAR-GRASS. SOAPWEED. Leaves very stiff, and sharp-pointed, 1°-3° long, 3"-6" wide, margin fibers filiform. Raceme mostly simple, 1°-6° long. Flowers 1½'-3' broad. Stigmas green, shorter than the ovary. Capsule 6-sided, 2'-3' long, about 1' thick.

In dry soil. Common. May-June.

II. ALLIUM (Tourn.) L.

Flowers perfect, umbellate. Style single, long. Flowers white, pink, purple, or greenish. Perianth of 6 sepals, often becoming dry and persistent. Leaves and scape rising from a coated bulb; leaves linear, lanceolate-oblong, or lanceolate. In one species flowers replaced by bulblets (*A. Canadense*). Plants with the odor of onions.

Bulb-coats membranous, not fibrous-reticulated.

1. *A. stellatum*.

Bulb-coats fibrous-reticulated.

Capsule not crested.

Flowers mostly replaced by bulblets; scape 8'-24' tall.

2. *A. canadense*.

Flowers rarely replaced by bulblets.

Scape 12'-24' tall; pedicels 8"-12" long; perianth-segments thin.

3. *A. mutabile*.

Scape 4'-8' tall; pedicels 4"-6" long.

Bulbs usually solitary; perianth-segments ovate, acute or acuminate.

4. *A. Nuttallii*.

Bulbs usually two together; perianth-segments oblong-lanceolate to elliptic, obtuse.

5. *A. Helleri*.

Capsule-valves with 2 short crests. 6. *A. reticulatum*.

1. *Allium stellatum* Ker. PRAIRIE WILD ONION. Scape terete, 8'-18' tall, slender, bearing an erect umbel. Bulb-coats membranous. Leaves linear. Umbel several-many-flowered, erect, subtended by 2 lanceolate or ovate, acuminate bracts. Pedicels filiform, 6"-10" long. Flowers rose-color, Capsule prominently 6-crested.

Rocky soil. Arbuckle Mountains. July-August.

2. *Allium canadense* L. MEADOW GARLIC. Scape 8'-24' tall. Bulb small, less than 1' high. Flowers pink or white, the perianth-segments oblong-lanceolate, acute, about as long as the stamens.

In moist soil. Oklahoma, Pottawatomie and Cleveland counties. May-June.

3. *Allium mutabile* Michx. WILD ONION. Scape terete, 12'-24' tall. Leaves basal, channeled, shorter than the scape. Flowers pink, rose or white, 2½"-4" long. Perianth-segments lanceolate or ovate-lanceolate, acute, acuminate, or obtusish, longer than the stamens. Capsule rather shorter than the perianth, its valves not crested.

Moist soil. Common. April-June.

4. *Allium Nuttallii* S. Wats. NUTTALL'S WILD ONION. Scape slender, terete or nearly so, 4'-8' tall. Leaves basal, shorter than the scape or sometimes equaling it. Flowers rose or white, about 3" long. Perianth-segments ovate, acute, or acuminate, firm, becoming rigid in fruit. Stamens shorter than the perianth. Valves of capsule not crested.

Prairies. Common. April-June.

5. *Allium Helleri* Small. HELLER'S WILD ONION. Bulbs ovoid, usually 2 together, fibrous-coated. Scape about 8' high, equaling or longer than the leaves. Leaves basal, linear. Bracts ovate to ovate-lanceolate, acute. Perianth white or rose.

Dry soil. April-June. Near Enid.

6. *Allium reticulatum* Don. FRASER'S WILD ONION. Similar to *A. Nuttallii*, the bulb rather larger, its coat prominently fibrous-reticulated. Scape 3'-10' tall, slender. Leaves usually less than 1" wide. Pedicels slender, 3"-6" long. Flowers white or pink, 2½"-3" long. Perianth segments longer than the stamens, thin.

Dry, gravelly soil. May-July. Payne County.

III. NOTHOSCORDUM Kunth.

Similar to *Allium*, but without the smell of onions.

Flowers yellowish-green in loose umbels. Ovules several in each cell of the ovary.

1. **Nothoscordum bivalve** (L.) Britton. YELLOW FALSE GARLIC. Scape 6'-14' high. Bulb small. Leaves narrowly linear. Flowers 5" long. Ovules 4-7 in each cell.

Prairies. Common. March-July.

IV. ANDROSTEPHIUM Torr.

Scapose herbs, with membranous-coated corms. Leaves basal, narrowly linear. Scape simple, topped by a several-rayed umbel, this subtended by several bracts. Flowers few, perfect, short-pedicelled. Perianth blue, funnel-form, withering-persistent, the tube about as long as the 6 oblong lobes. Stamens 6, inserted on the throat of the perianth. Filaments united to the middle or above into an erect, crown-like tube with the linear, oblong anther. Ovary 3-celled. Style filiform. Stigma 3-grooved. Ovules several in each cavity. Capsule 3-angled, membranous. Seeds few, large, oval, black.

1. **Androstephium coeruleum** (Scheele) Greene. ANDROSTEPHIUM. Bulbs ovoid, with thin outer coats. Leaves basal, blades flat or half terete, equaling the scape, or sometimes longer. Bracts of the umbel 2-4, scarious, lanceolate, acuminate, persistent, shorter than the pedicels. Perianth 10"-13" long, the lobes about as long as the tube.

Prairies. Common. March-April.

V. ERYTHRONIUM L.

Flowers perfect. Perianth-segments distinct and petal-like. Style single, long, and uncleft. Nearly stemless herbs with two smooth and shining, flat leaves tapering into petioles and sheathing the base of the usually one-flowered scape which rises from a deeply placed bulb. Flowers rather large.

Offshoots produced at the base of the corm; perianth-segments recurved,

I. **E. albidum.**

No offshoots, propagated by basal corms; perianth-segments not recurved.

II. **E. mesachoreum.**

1. **Erythronium albidum** Nutt. WHITE ADDERS-TONGUE. Leaves elliptical-lanceolate, some or not at all spotted. Perianth pinkish-

white. Inner divisions toothless. Style slender except near the apex, bearing 3 short spreading stigmas.

Rich soil. Near Avery, Oklahoma. March-May.

2. **Erythronium mesachoreum** Knerr. MIDLAND ADDER'S TONGUE. Leaves narrowly lanceolate or linear-lanceolate, not mottled. Perianth-divisions bluish or lavender-tinted, scarcely or not at all recurved. Stigmas spreading.

Prairies. March-April. Oklahoma and Cleveland counties.

FAMILY 5. CONVALLARIACEÆ. LILY-OF-THE-VALLEY FAMILY.

Scapose or leafy-stemmed herbs, with simple or branched rootstocks, never with bulbs or corms. Flowers solitary, racemose, paniced or umbeled, regular and perfect. Leaves broad, alternate, verticillate or basal. Perianth inferior, 4-6-parted with separate segments, or oblong, cylindric or urn-shaped and 6-lobed or 6-toothed. Stamens 6, hypogynous or borne on the perianth. Ovary 2-3-celled, superior. Fruit a fleshy berry.

Perianth-segments separate.

I. **Streptopus.**

Perianth-segments united into a tube II. **Polygonatum.**

I. STREPTOPUS Michx.

Branching herbs, with horizontal rootstocks. Leaf-blades thinnish, sessile or clasping. Flowers solitary, or two together, nodding from extra-axillary peduncles. Perianth greenish or purplish. Sepals and petals 3 each, separate, with spreading or recurved tips, the petals keeled. Stamens 6-hypogynous. Filaments flattened, very short. Ovary 3-celled. Stigma entire or 3-lobed. Berry red, oval, or sub-globose.

1. **Streptopus amplexifolius** (L.) DC. CLASPING-LEAVED TWISTED-STALK. Rootstock short, stout, horizontal, covered with thick, fibrous roots. Plants 18'-36' high. Stem glabrous, usually branching below the middle. Leaves 2'-5' long, 1'-2' wide, acuminate at the apex, cordate-clasping at the base, glabrous, glaucous beneath. Peduncles 1'-2' long, 1-2-flowered. Flowers greenish-white, 4"-6" long. Perianth segments nearly lanceolate, acuminate.

II. POLYGONATUM (Tourn.) Mill.

Glabrous or pubescent herbs, with thick, horizontal, jointed, and scarred rootstocks. Simple, arching or erect stems, scaly below, leafy above, the leaves ovate or lanceolate, sessile and alternate. Flowers greenish or pinkish, axillary, drooping, peduncled, solitary or 2-10 in an umbel, the pedicels joined at the base of the flower. Stamens 6, included. Filaments adnate to the perianth for half their length or more.

1. *Polygonatum commutatum* (R. & S.) Dietr. SMOOTH SOLOMON'S SEAL. Glabrous throughout, stem stout or slender, 1°-8° high. Leaves lanceolate, oval or ovate, 1½'-6' long, darker green above than beneath, acute, acuminate or blunt at the apex, narrowed, rounded or somewhat clasping at the base. Peduncles 1-8-flowered, glabrous. Perianth 6'-10" long. Berry 4"-6" in diameter.

In moist woods. Collected by A. H. Van Vleet. May-July.

FAMILY 6. SMILACEÆ. SMILAX FAMILY.

Perennial vines, with woody or herbaceous, often prickly stems. Leaves alternate; blades several-nerved and netted-veined, usually punctate, petioled. Petiole persistent, commonly bearing a pair of elongated appendages. Flowers dioecious, in axillary, peduncled umbels. Perianth segments 6. Sepals and petals 3 each, with spreading tips. Fruit a berry.

I. SMILAX L.

Rootstocks usually very large and tuberous, stems usually twining, and climbing by means of the spirally coiled appendages of the petiole. Lower leaves reduced to scales; upper leaves entire or lobed. Flowers regular. Perianth-segments distinct, deciduous. Filaments inserted on the bases of the perianth-segments. Pistillate flowers usually smaller than the staminate, usually with 1-6 abortive stamens. Berry black, red or purple.

Stem annual, herbaceous, unarmed.

1. *S. herbacea*.

Stem perennial, woody, usually armed with prickles.

Leaves glaucous.

2. *S. glauca*.

Leaves green on both sides.

Leaves rounded or lanceolate, 5-nerved.

3. *S. Rotundifolia*.

Leaves ovate, 7-nerved.

4. *S. hispida*.

Leaves round-ovate, often narrowed at the middle,
7-9-nerved.

5. *S. Pseudo-China*.

Leaves deltoid or deltoid-hastate, 5-7-nerved, often
with 1 or 2 additional nerves on each side.

6. *S. Bona-nox*.

1. ***Smilax herbacea* L.** CARRION-FLOWER. Stem glabrous, unarmed, much branched. Leaves ovate, rounded or lanceolate, acute, acuminate or cuspidate at the apex, obtuse or cordate at the base. 7-9-nerved, margins entire or denticulate. Flowers carrion-scented when open. Berries bluish black, 3"-4" in diameter.

In woods and thickets. Collected by A. H. Van Vleet. April-June.

2. ***Smilax glauca* Walt.** GLAUCOUS-LEAVED GREENBRIER. Stem terete. Branches and twigs angled, armed with rather stout, numerous, or scattered prickles, or sometimes unarmed. Petioles 3"-6" long, tendril-bearing. Leaves ovate, acute or cuspidate at the apex, sometimes cordate at the base, entire, glaucous beneath and sometimes also above, mostly 5-nerved, umbels 6-12-flowered. Berries bluish black, ripening the first year, about 3" in diameter, 2-3-seeded.

In thickets. May-June.

3. ***Smilax rotundifolia* L.** GREENBRIER. Stem woody, terete, the branches and young shoots often 4-angled, glabrous. Prickles scattered, stout, straight or a little curved, sometimes none. Leaves ovate, nearly orbicular, or lanceolate, acute or acuminate at the apex, obtuse or cordate at the base, entire or the margins erose-denticulate, 5-nerved. Umbels 6-25-flowered. Perianth-segments pubescent at the tip. Berries black, 1-3-seeded, about 3" in diameter. Maturing the first year.

In woods and thickets. Common. April-June.

4. ***Smilax hispida* Muhl.** HISPID GREENBRIER. Stem terete below, glabrous, and commonly thickly hispid with numerous, slender, straight prickles, the branches more or less angled. Leaves ovate, abruptly acute and cuspidate at the apex, obtuse or sub-cordate at the base, 7-nerved, or the older ones sometimes with an additional pair of faint nerves, the margins usually denticulate. Umbels 10-

26-flowered. Berries bluish black, about 3" in diameter, maturing the first year.

In thickets. Common. May-June.

5. *Smilax Pseudo-China* L. LONG-STALKED GREENBRIER. Stem terete, glabrous, the branches angled. Lower part of the stem beset with straight, needle-shaped prickles, the upper part and the branches mostly unarmed. Leaves ovate, often narrowed at about the middle or lobed at the base, acute or cuspidate at the apex, 7-9-nerved, often denticulate on the margins. Umbels 12-40-flowered. Berries black, 8-16 in the umbels, 2"-3" in diameter, 1-3-seeded, maturing the first year.

In dry or sandy thickets. Collected by J. W. Blankinship. March-August.

6. *Smilax Bona-nox* L. BRISTLY GREENBRIER. Stem terete or slightly angled, the branches often 4-angled. Prickles scattered or numerous, stout or needle-like, often wanting on the branches. Petioles 3"-6" long, often prickly. Leaves ovate or commonly deltoid-hastate, sometimes narrowed at the middle, often spiny on the margins and on the veins beneath, acute or abruptly cuspidate at the apex, obtuse, truncate or cordate at the base, 5-9-nerved. Umbels 15-45-flowered. Stigmas 1-3. Berries 8-20 in the umbels, 2"-3" in diameter, mostly one-seeded, ripening the first year.

In thickets. Common. April-July.

FAMILY 7. AMARYLLIDACEÆ. AMARYLLIS FAMILY.

Perennial herbs, with bulbs or rootstocks, scapose or sometimes leafy stems and usually narrow and entire leaves. Flowers perfect, regular or nearly so. Perianth 6-parted or 6-lobed, the segments or lobes distinct, or united below into a tube which is adnate to the surface of the ovary. Stamens 6. Style 1. Capsule 3-celled, several-many-seeded.

Bulbous herbs with flowers on scapes.

Flower solitary; perianth without a crown.

Anthers erect; tube of the perianth several times the length of its lobes. **I. *Cooperia*.**

Flowers clustered; perianth with a membranous

crown connecting the lower parts of the filaments.

II. Hymenocallis.

Bulbless herbs, with rootstocks or corms.

Tall, fleshy-leaved; anthers versatile.

III. Manfreda.

Low, linear-leaved; anthers not versatile.

IV. Hypoxis.

I. COOPERIA Herb.

Perianth tube very long and slender, the limb widely spreading, 6-parted, the short stems borne on the throat. Spathe single, membranaceous. Capsule depressed-globose. Seeds numerous. Leaves grass-like from a tunicate bulb.

1. Cooperia Drummondii Herb. DRUMMOND'S COOPERIA. Scape slender 8'-20' high. Perianth white or rose-tinged, the stalk-like tube often 4' in length.

On prairies. Collected by Stemen and Myers in Oklahoma and Comanche counties. April-July.

II. HYMENOCALLIS Salisb.

Capsule thin, 2-3-lobed. Seeds usually 2 in each cell, basal, fleshy, often like bulblets. Scapes and leaves from a coated bulb. Flowers white, fragrant, large, and showy, sessile in an umbel-like head or cluster, subtended by 2 or more scarious bracts.

1. Hymenocallis occidentalis (LeConte) Kunth. HYMENOCALLIS. Bulb large. Leaves linear-oblong, narrowed at each end, fleshy, glaucous, 12'-24' long, 9"-2' wide. Scape stout, equaling or longer than the leaves. Bracts linear-lanceolate, 1½'-2½' long. Umbel several flowered. Crown funnel-form, narrowed below, its margins entire, erose or 2-toothed between the filaments. Filaments adnate to the perianth tube. Ovary 3-celled. Ovules 1 or 2 in each cavity.

In moist soil. McCurtain County. May-September.

III. MANFREDA Salisb.

Fleshy herbs with bulbiferous rootstocks and bracted

scapes, the leaves basal, and large bracted flowers in terminal spikes or racemes. Perianth tubular or funnel-form, withering-persistent, of 6 erect or spreading, equal or nearly equal lobes, united below into a tube. Stamens inserted on the perianth, exserted. Ovary 3-celled, style slender, exserted, 3-lobed. Capsule ovoid, sub-globose, or oblong, 3-lobed, 3-celled, thick-walled, many seeded. Seeds compressed.

1. **Manfreda virginica** (L.) Salisb. FALSE ALOE. Rootstock a short crown, with numerous, fibrous roots. Scape 2°-6° tall, bracts distant, long-acuminate. Leaves narrowly oblong, 6'-24' long, 1½'-2½' wide, acuminate, their margins entire or denticulate. Fragrant. Perianth 8"-12" long, its narrow tube twice longer than the erect lobes.

In dry soil. Wichita Mountains. May-July.

IV. HYPOXIS L.

Small, apparently stemless herbs. Leaves grass-like, hairy, from a solid bulb. Scapes thread-like, few-flowered. Perianth 6-parted, wheel-shaped, the 3 outer divisions greenish on the outside, the whole perianth withering on the pod. Seeds numerous.

1. **Hypoxis hirsuta** (L.) Coville. YELLOW STAR-GRASS. Leaves longer than the scape, both sparsely set with long, soft hairs. Scape 3'-8' high. Flowers 1-4, about ½' across, yellow.

In moist or dry soil. Oklahoma County. May-October.

FAMILY 8. IRIDACEÆ. IRIS FAMILY.

Perennial herbs from bulbs, corms, or rootstocks. Leaves 2-ranked, equitant. Flowers perfect, regular or irregular, subtended by bracts. Perianth tube adnate to the ovary, the segments or lobes in 2 series, convolute in the bud, withering-persistent. Stamens 3, distinct or monadelphous, alternate with the petals, with extrorse anthers. Ovary inferior, mostly 3-celled. Ovules mostly numerous in each cell, anatropous. Style 3-cleft. Capsule 3-celled, 3-angled or 3-lobed, many-seeded.

Style-branches 2-cleft, plants bulbous.

I. *Nemastylis*

Style-branches undivided, plants not bulbous.

II. *Sisyrinchium*.

I. *NEMASTYLIS* Nutt.

Bulbous herbs with erect, slender, terete, usually branched stems and elongated, linear folded leaves. Flowers rather large, in our species blue or purple, solitary or several together, fugacious, subtended by 2 herbaceous bracts. Perianth 6-lobed. Stamens 3. Ovary 3-celled. Styles alternate with the stamens, each parted into 2 filiform segments. Ovules numerous. Capsule obovoid, truncate, dehiscent at the summit.

1. *Nemastylis acuta* (Bart.) Herb. NORTHERN *NEMASTYLIS*. Stem 4'-24' high. Spathes 2-flowered. Flowers 1'-2' broad, the divisions oblong-obovate, obtuse. Capsule obovoid, 5"-6" high, 3"-4" in diameter.

On prairies. Payne, Comanche and Murray counties. April-June.

II. *SISYRINCHIUM* L.

Sepals and petals (perianth) alike, spreading. Capsule globular, 3-angled. Seeds globular. Low, slender perennials, with fibrous roots, grassy or lanceolate leaves, 2-edged or winged stems, and fugacious umbeled-clustered small flowers from a usually 2-leaved spathe.

1. *Sisyrinchium graminoides* Bicknell. Stiut. BLUE-EYED GRASS. Stem broadly 2-winged, stout, erect or reclining, usually terminating into unequal branches subtended by a conspicuous grassy leaf. Basal leaves equaling or shorter than the stem, often lax and grass-like. Umbel 2-4-flowered. Flower 6"-9" broad. Capsule sub-globose, 2½"-3" in diameter when mature.

In moist or dry soil, grassy places. Common. April-June.

CLASS II. Dicotyledonous Plants.

Stems formed of bark, wood, and pith. Leaves netted-veined. Flowers with their parts in 5's or 4's. Cotyledons 2.

FAMILY 9. JUGLANDACEÆ. WALNUT FAMILY.

Trees with alternate, odd-pinnate leaves without stipules. Flowers monœcious, the staminate in long and drooping catkins. Stamens few or many. Calyx 2-6-parted. Fertile flowers solitary or in small clusters. Calyx 3-5-lobed, minute petals sometimes present. Ovary inferior, 1-celled or incompletely 2-4-celled. Fruit (strictly speaking, a drupe) with a dry husk inclosing a bony nut.

Husk indehiscent; nut rugose.

I. **Juglans.**

Husk at length splitting into segments; nuts smooth or angled.

II. **Hicoria.**

I. JUGLANS L.

Staminate catkins cylindrical, solitary, borne on wood of the previous year. Stamens numerous, filaments short. Calyx 4-6-parted. Pistillate flowers, single or a few together on a short peduncle at the base of the growth of the season. Calyx 4-parted. Petals 4, minute, epigynous. Styles 2, short, plumose. Fruit large, roundish or oval, husk fibrous-fleshy, becoming dry, indehiscent. Nut bony, very rough.

1. **Juglans nigra** L. BLACK WALNUT. Leaflets 13-21, ovate-lanceolate, serrate, taper-pointed, somewhat cordate or oblique at the base, nearly smooth above, downy beneath. Petioles minutely downy. Fruit usually single, roundish, about 2' in diameter.

In rich woods. Common along streams. April-May.

II. HICORIA Raf.

Leaflets serrate. Staminate catkins usually in 3's on a common peduncle, or sometimes sessile at the base of the growth of the season; calyx 2-3-parted. Stamens 3-10, filaments short. Pistillate flowers 2-5 in terminal clusters. Calyx 4-parted. Petals none. Styles 2 or 4, fringed. Fruit somewhat globular, husk separating more or less completely into 4 valves. Nut smooth or angled.

Bud scales few, valvate; lateral leaflets lanceolate or oblong-lanceolate, falcate.

Nut not compressed or angled; seed sweet.

1. *H. Pecan*.

Nut somewhat compressed or angled; seed intensely bitter.

Leaflets 5-9; nut smooth. 2. *H. cordiformis*.

Leaflets 9-13; nut angled. 3. *H. aquatica*.

Bud-scales imbricate; lateral leaflets not falcate.

Husk of the fruit freely splitting to the base; bract of the staminate calyx at least twice as long as the lobes.

Bark shaggy, separating in long plates; foliage glabrous or puberulent.

Leaflets oval to oblong-lanceolate, puberulent.

4. *H. ovate*.

Bark close, rough; foliage very pubescent and fragrant.

Rachis of the leaves and staminate catkins densely hirsute. 5. *H. alba*.

Husk of fruit not freely splitting to the base; bract of the staminate calyx about as long as the lobes.

6. *H. glabra*.

1. **Hicoria Pecan** (Marsh) Britton. PECAN. Minutely downy, becoming nearly smooth. Leaflets 9-17, ovate-lanceolate, tapering gradually to a slender point, falcate, serrate. Nut olive-shaped.

River bottoms. Common. April-May.

2. **Hicoria cordiformis** (Wang.) Britton. BITTER-NUT. SWAMP HICKORY. A slender tree, the bark close and rough. Bud-scales 6-8, small, valvate, caducous, young foliage puberulent, becoming nearly

glabrous. Leaflets 7-9, sessile, long-acuminate, lanceolate or oblong-lanceolate, the lateral ones falcate. Staminate aments slightly pubescent, peduncled in 3's at the bases of the shoots of the season or sometimes on twigs of the previous year. Lobes of the staminate calyx about equal, the bract narrower. Fruit sub-globose, narrowly 6-ridged. Husk thin, tardily 4-valved. Nut little compressed, not angled, thin-shelled. Seed very bitter.

In moist woods and swamps. Harrah, Oklahoma, and eastern part of state. May-June.

3. *Hicoria aquatica* (Michx.) Britton. WATER or SWAMP HICKORY. A swamp tree, attaining a maximum height of about 100°, the bark close, the young foliage pubescent, becoming nearly glabrous when mature. Leaflets 9-13, lanceolate, or the terminal one oblong, long-acuminate at the apex, narrowed at the base, the lateral strongly falcate. Staminate aments and calyx as in the preceding species. Fruit oblong, ridged, pointed. Husk thin, tardily splitting. Nut oblong, thin-shelled, angular, seed bitter.

Wet woods and swamps. Eastern part of the state. March-April.

4. *Hicoria ovata* (Mill.) Britton. SUELL-BARK HICKORY. Tree becoming 120° tall, the bark separating in large plates. Leaflets 5, or rarely 7. The blades of the lateral ones oval to oblong-lanceolate. Staminate aments slender, 4'-6' long. Fruits sub-globose, 1'-2' thick, the husk thick. Nut slightly angled, thin-shelled, the seed sweet.

In rich soil. Eastern part of the state. May.

5. *Hicoria alba* (L.) Britton. WHITE-HEART HICKORY. MOCK-ERNUT. Tree becoming 100° tall, the bark with flat ridges. Leaflets 7-9, the blades of the lateral ones oblong or oblong-lanceolate. Staminate aments stout, 4'-6' long. Fruits globose or globose-obovoid, 1½'-3½' long. Husk thick, freely splitting to the base. Nut grayish white, angled, pointed at the summit, little compressed, thick-shelled. Seed sweet.

In rich soil. Eastern part of the state. May-June.

6. *Hicoria glabra* (Mill.) Britton. PIG-NUT HICKORY. Tree becoming 120° tall, the bark close, rough. Leaflets mostly 3-7, rarely 9, the blades of the lateral ones oblong or oblong-lanceolate, acuminate, green beneath, glabrous. Staminate aments glabrous, peduncled in 3's, 2½'-4' long. Fruit sub-globose, obovoid or obovoid-oblong, 1½'-2' long. Husk thin. Nut brown, angled, pointed, very thick-shelled. Seed astringent and bitter, not edible.

In dry or moist woods. Payne county. May-June.

FAMILY 10. SALICACEÆ. WILLOW FAMILY.

Dioecious trees or shrubs, with flowers in catkins, destitute of floral envelopes. Fruit a 1-celled pod, with nu-

merous seeds, provided with rather long and silky down, by means of which they are transported by the wind.

Bracts fimbriate or incised; stamens numerous; stigmas elongated.

I. Populus.

Bracts entire; stamens 2-10; stigmas short.

II. Salix.

I. POPULUS. L.

Trees with scaly, resinous buds, terete or angled twigs and broad or narrow, usually long-petioled leaved. The stipule minute, fugacious. Staminate aments dense, pendulous. Pistillate aments pendulous, erect or spreading. Ovary sessile. Style short, stigmas 2-4, entire or 4-lobed.

1. Populus deltoides Marsh. COTTONWOOD. A tree attaining the height of 150° and a trunk diameter of 7°-8°. Foliage glabrous. Leaves broadly deltoid-ovate, abruptly acuminate at the apex, crenulate, truncate at the base. Petiole flattened laterally, stout. Bracts glabrous, deeply-fimbriate. Staminate aments drooping, 3'-5' long, 5"-6" in diameter. Pistillate aments loosely flowered. Capsules ovoid, acute, 2-4-valved.

In moist soil. Common. March-May.

II. SALIX (Tour.) L.

Shrubs or trees, with single-scaled buds. Leaves usually long and narrow. Stipules sometimes leaf-like or often small and soon deciduous. Bracts of the catkins entire. Staminate flowers with 1-10, mostly 2, stamens, distinct or united. Pistillate aments usually erect or spreading. Stigmas 2, entire or 2-cleft.

Stamens 3-7; filaments hairy at the base; bracts caducous, light yellow.

Leaves green or pale beneath.

Leaves narrowly lanceolate; petioles very short.

1. S. nigra.

Leaves broadly lanceolate; petioles slender.

2. S. amygdaloides.

Leaves whitish beneath.

3. S. Wardi.

Stamens 2.

Leaves entire, finely and almost permanently silky.

4. *S. exigua*.

Leaves denticulate, coarsely silky when young,
glabrate in age.

5. *S. interior*.

1. **Salix nigra** Marsh. BLACK WILLOW. A tree, rough, flaky, dark brown bark, attaining a height of about 120°. Leaves narrowly lanceolate, acute or acuminate at the apex, narrowed at the base, often falcate, short petioled, serrulate. Stipules various, persistent or deciduous. Aments expanding with the leaves, on short lateral branches, the staminate 1'-2' long, the pistillate 1½'-3' long and spreading in the fruit. Stamens 3-7, distinct. Filaments soft, hairy below. Capsule ovoid, acute, glabrous.

Along streams and lakes. Common. April-May.

2. **Salix amygdaloides** Anders. PEACH-LEAVED WILLOW. A small tree sometimes 70° high, the brown bark scaly. Leaves lanceolate or ovate-lanceolate, long-acuminate at the apex, narrowed at the base, sharply serrate. Petioles 3"-7" long, glandless. Pistillate aments becoming very loose in fruit, 2½'-4' long. Capsule narrowly ovoid, acute, glabrous.

On lakes and river banks. Common. April-May.

3. **Salix Wardi** Bebb. WARD'S WILLOW. A tree sometimes 30° high, the branches spreading or drooping, the bark dark reddish-brown. Leaves lanceolate or oblong-lanceolate, long-acuminate or acute at the apex, rounded, subcordate, or narrowed at the base, bright green above, silvery white and somewhat pubescent beneath. Stipules often large, sometimes persistent. Aments terminal. Filaments pilose at the base. Capsules conic, glabrous, glandular-granulose.

Along streams and lakes. Common. March-May.

4. **Salix exigua** Nutt. A shrub or small tree up to 20° high. Leaves linear to linear-oblong, small, usually not more than 3' long and 3" wide, entire, acute at each end. Aments borne on lateral, leafy branches, 2' long or less. Capsule silky when young and glabrous when mature.

River and lake shores. April-May.

5. **Salix interior** Rowlee. SANDBAR or RIVER-BANK WILLOW. A much branched shrub, 2°-30° tall. Leaves linear-lanceolate or linear-oblong, acuminate, remotely denticulate with somewhat spreading teeth. Petioles not glandular. Capsule ovoid-conic, glabrous or silky, about 2" long.

Along streams and lakes. April-May.

FAMILY 11. BETULACEÆ. BIRCH FAMILY.

Trees or shrubs with alternate, simple, petioled leaves, with usually deciduous stipules. Flowers monœcious in cylindrical or sub-globose aments. Staminate aments drooping. Flowers 1-3 in the axil of each bract. Calyx none or membranous and 2-4-parted. Stamens 2-10, distinct. Calyx none or membranous and 2-4-parted. Stamens 2-10, distinct. Pistillate aments drooping, spreading, or erect and spike-like. Ovary solitary, 1-2-celled. Ovules 1-2 in each cell. Fruit a 1-celled nut or a key.

Staminate flowers solitary in the axil of each bract, destitute of a calyx; pistillate flowers with a calyx.

Fruiting bractlet flat; 3-cleft and incised.

I. Carpinus.

Fruiting bractlet bladder-like, closed, membranous.

II. Ostrya.

Staminate flowers 3-6 together in the axil of each bract, with a calyx; pistillate flowers without a calyx.

Stamens 2; filaments 2-cleft; fruiting bracts 3-lobed or entire, deciduous

III. Betula.

I. CARPINUS L.

Trees with thin, straight-veined leaves, primary veins terminating in the larger teeth. Staminate aments linear-cylindric, sessile at the ends of short, lateral branches of the preceding season, their flowers solitary in the axil of each bract. Pistillate flowers in small terminal aments, 2 to each bract, consisting of a 2-celled ovary adnate to a calyx and subtended by flat, persistent bractlet, foliaceous and lobed, or incised in fruit. Fruit a small, angular nut.

1. Carpinus caroliniana Walt. AMERICAN HORNBEAM. Leaves ovate-oblong, pointed, sharply double-serrate, soon nearly smooth. Bractlets 3-lobed, halberd-shaped, sparingly cut-toothed on one side, acute.

In moist woods and along streams. April-May. Eastern part of the state.

II. OSTRYA (Micheli) Scop.

Trees similar to the Hornbeams, the primary veins of the leaves simple or forked. Staminate aments sessile at the ends of branchlets of the preceding season, flowers solitary in the axil of each bract. Pistillate aments small, terminal, erect, the flowers 2 to each bract, subtended by a tubular, persistent bractlet which enlarges into a membranous, nerved, bladder-like sac in fruit. Fruit a small, pointed, smooth nut. Mature pistillate ament hop-like.

1. *Ostrya virginiana* (Mill.) Willd. IRONWOOD. HOP HORNBEAM. Leaves oblong-ovate, taper-pointed, very sharply double-serrate, downy beneath, with 11-15 principal veins. Buds acute. Involucral sacs bristly-hairy at the base.

In rich woods. April-May. Eastern part of the state.

III. BETULA (Tourn.) L.

Trees with slender, aromatic twigs, and thin, usually straight-veined leaves. Staminate aments drooping, flowers usually 3 in the axil of each bract. Stamens 4, short. Anthers 1-celled. Pistillate aments erect, flowers 2 or 3 in the axil of each bract. Ovary sessile, 2-celled. Styles 2. Bracts 3-lobed. Perianth none. Nut broadly winged.

1. *Betula nigra* L. RIVER BIRCH. RED BIRCH. A medium-sized tree with reddish-brown bark. Leaves rhombic-ovate, acute at the apex, acute or obtuse at the base, sharply and doubly serrate, white-downy below, becoming smoother with age, petioles short. Staminate catkins 2'-3' long. Pistillate catkins 1'-1½' long, peduncles short, bracts nearly equally 3-cleft, wooly.

Borders of streams, rivers and in swamps. April-May.

FAMILY 12. FAGACEÆ. BEECH FAMILY.

Trees or shrubs. Leaves alternate, simple, pinnately veined. Stipules deciduous. Flowers monœcious, the staminate in heads, or in drooping, spreading, or erect catkins. Calyx minute. Petals none. Stamens 4-20. Pis-

tillate flowers solitary or in small clusters, each flower subtended by more or less united bracts, which at maturity form a cup or bur. Calyx minutely toothed; petals none; ovary 2-7-celled, but becoming 1-celled. Fruit a 1-seeded nut.

Staminate flowers capitate; nut sharply triangular.

I. Fagus.

Staminate flowers in slender aments or catkins; nut rounded or plane-convex.

II. Quercus.

I. FAGUS (Tourn.) L.

Trees with smooth, close, ash-gray bark, and slender, often horizontal branches. Staminate flowers in long, slender-peduncled, roundish clusters; calyx bell-shaped, 4-6-cleft; stamens 8-12; anthers 2-celled. Pistillate flowers, or, more often, in pairs, peduncled, surrounded by a 4-lobed involucre and numerous linear bracts; ovary 3-celled, with 2 ovules in each cell, but usually only one ovule maturing in each ovary; styles 3, thread-shaped. Fruit a thin-shelled, 3-angled nut.

1. Fagus grandifolia Ehrh. AMERICAN BEECH. Large tree. Leaves oblong-ovate, taper-pointed, distinctly and often coarsely toothed, light green. Petioles and midrib soon nearly naked. Prickles of the yellowish fruit subulate-filiform, elongated, recurved or spreading.

Rich soil. April-May. Eastern part of state.

II. QUERCUS (Tourn.) L.

Trees or shrubs, with hard, coarsely-grained wood. Leaf blades entire, toothed, or lobed, firm-membranous or leathery, sometimes evergreen. Staminate aments or catkins elongate, drooping, clustered; calyx campanulate, 4-7-lobed, stamens 6-12; filaments filiform. Pistillate flowers solitary or in lax spikes; calyx urn-shaped or cup-shaped. Ovary usually 3-celled; styles 3; ovules 2 in each cell, but seldom more than one maturing in each

pistil. Fruit a leathery, 1-seeded nut (acorn), partly enclosed in an accrescent, scaly involucre (cup).

1. Leaves or their lobes bristly-tipped, deciduous; acorns maturing in autumn of second year.

A. Leaves pinnatifid or pinnately lobed.

Leaves green on both sides.

Cup of the acorn saucer-shaped, much broader than high.

Cup 8"-12" broad; acorns ovoid; leaves dull.

1. *Q. rubra*.

Cup 4"-8" broad; leaves shining.

Acorn sub-globose or short-ovoid; northern.

2. *Q. palustris*.

Acorns ovoid; southern.

3. *Q. Schneckii*.

Cup of the acorn turbinate or hemispheric.

Inner bark gray to reddish; leaves deeply lobed.

4. *Q. coccinea*.

Inner bark orange; leaves pubescent in the axils of the veins beneath.

5. *Q. velutina*.

Leaves white or gray-tomentose beneath.

6. *Q. triloba*.

- B. Leaves 3-5-lobed above the middle or entire, obovate or spatulate in outline.

Leaves obovate-cuneate, brown-floccose beneath.

7. *Q. marilandica*.

Leaves spatulate to obovate, glabrous both sides.

8. *Q. nigra*.

- C. Leaves entire, oblong, lanceolate or linear-oblong.

Leaves linear-oblong, green and glabrous on both sides.

9. *Q. Phellos*.

Leaves oblong or lanceolate, brown-tomentulose beneath.

10. *Q. inbricaria*.

2. Leaves or their lobes not bristle-tipped, deciduous; acorns maturing in autumn of first year.

A. Leaves pinnatifid or pinnately lobed.

Mature leaves pale, or glaucous and glabrate beneath;
cup shallow. 11. *Q. alba*.

Mature leaves tomentulose beneath; cup one-third to
fully as long as the acorn.

Upper scales of the cup not awned.

Leaves yellowish-brown-tomentulose beneath;
acorn ovoid. 12. *Q. stellata*.

Leaves white-tomentulose beneath; acorn de-
pressed-globose. 13. *Q. lyrata*.

Upper scales awned, forming a fringe around the
acorn. 14. *Q. macrocarpa*.

B. Leaves crenate or dentate, not lobed.

Fruit peduncled.

Peduncle much longer than petioles; leaves white-
tomentulose beneath. 15. *Q. bicolor*.

Peduncle equaling or shorter than the petioles;
leaves gray-tomentulose beneath.

Teeth of the leaves acute or mucronulate.

16. *Q. Michauxii*.

Teeth of the leaves rounded. 17. *Q. Prinus*.

Fruit sessile or nearly so.

Tall tree; leaves oblong, obovate or lanceolate.

18. *Q. Muhlenbergii*.

Shrub or low tree; leaves oval or obovate.

19. *Q. prinoides*.

3. Leaves entire (rarely with a few bristle-tipped lobes),
evergreen. 20. *Q. virginiana*.

1. **Quercus rubra** L. RED OAK. A large tree. Leaves oval or obovate, green above, pale and slightly downy beneath. Sinuses shallow and rounded, lobes 8-12, taper-pointed. Petioles long. Cups saucer-shaped, with fine scales. Acorn ovate or oblong, about 1' long.

Found in both rich and poor soil. Eastern part of the state. May-June.

2. *Quercus palustris* DuRoi. SWAMP OAK or PIN OAK. A large tree, bark brown, rough when old. Leaves broadly oblong or obovate in outline, deeply pinnatifid, sometimes almost to midrib, bright green, glabrous and shining above, duller, glabrous or with tufts of hairs in the axils of the veins beneath, the lobes oblong, lanceolate or triangular-lanceolate, divergent, 1-4-toothed or entire, teeth and apices tipped with filiform bristles. Cup saucer-shaped, 4"-6" broad, base flat, bracts triangular-ovate, acute or obtuse, appressed. Acorn sub-globose or ovoid, 4"-7" high, often striate, 2-3 times as long as the cup.

In moist ground. May-June.

3. *Quercus Schneckii* Britton. SCHNECK'S OAK. Large tree. Leaves mostly obovate in outline, bright green and shining above, paler and with tufts of wool in the axils beneath, 2'-6' long, truncate or broadly wedge-shaped at the base, deeply pinnatifid into 5-9 oblong or triangular lobes, which are entire or coarsely few-toothed, the lobes and teeth bristle-tipped, cup deeply saucer-shaped, 6"-8" broad, its scales obtusish or acute, appressed. Acorn ovoid, $\frac{1}{2}$ '-1' long, 2-3 times as high as the cup.

Plains and prairies. April-May.

4. *Quercus coccinea* Wang. SCARLET OAK. Leaves deeply pinnatifid, glabrous, bright green and shining above, paler and sometimes pubescent in the axils of the veins beneath, 4'-8' long, rather thin, the lobes oblong or lanceolate, divergent or ascending, few-toothed, the teeth and apices bristle-tipped. Cup hemispheric or top-shaped, its bracts triangular-lanceolate, appressed or the upper slightly squarrose, mostly glabrous. Acorn ovoid or ovoid-globose, 6"-10" high, about twice as long as the cup.

In dry soil. May-June.

5. *Quercus velutina* Lam. BLACK OAK. Leaves pinnatifid or lobed to beyond the middle, firm, brown-pubescent or sometimes stellate-pubescent when young; when mature, glabrous and dark dull green above, pale green and usually pubescent on the veins beneath, the broad oblong or triangular-lanceolate lobes and their teeth bristle-tipped. Cup hemispheric or top-shaped, $\frac{3}{4}$ '-1' broad, commonly narrowed into a short stalk, its bracts mostly pubescent, the upper somewhat squarrose. Acorn ovoid, $\frac{1}{2}$ '-1' high, longer than the cup.

In rocky or sandy soil. May-June.

6. *Quercus triloba* Michx. SPANISH or WATER OAK. Leaves dark green and glabrous above, gray-tomentulose beneath, deeply pinnatifid into 3-7 linear or lanceolate, often falcate, acuminate, entire or dentate lobes. Teeth and apices bristle-tipped. Terminal lobes commonly elongated. Cup saucer-shaped with a turbinate base, 5"-7" broad, its bracts ovate, obtuse, appressed. Acorn sub-globose or depressed, about twice as high as the cup.

In dry soil. May to June.

7. *Quercus Marilandica* Muench. BLACK JACK OAK. A tree sometimes 60° high, usually lower. Leaves obovate in outline, stellate-pubescent above and brown-tomentose beneath when young, 3-5 lobed toward the broad, usually nearly truncate, apex, cuneate below, the lobes short, entire or sparingly toothed, bristle-tipped. Mature leaves dark green, glabrous above, paler and more or less floccose beneath. Cup deep, 5"-8" broad, its bracts oblong-lanceolate, appressed, pubescent. Acorn ovoid, 2-3 times as high as the cup.

In dry soil. May-June.

8. *Quercus nigra* L. WATER or BLACK JACK OAK. A small tree. Leaves spatulate or obovate, 1-3-lobed at the apex, or some of them entire and rounded, coriaceous, short-petioled, finely reticulate-veined, glabrous when mature except tufts of hairs in the axil of the veins beneath, the lobes low, usually obtuse, and bristle-tipped. Cup saucer-shaped with a rounded base, 5"-7" broad, its bracts appressed. Acorn globose-ovoid, 2-3 times as high as the cup.

Along streams and on upland. April-May.

9. *Quercus Phellos* L. WILLOW OAK. A tree of medium size, leaves lanceolate or elliptical, scurfy when young and becoming smooth with age, very short-petioled. Cup shallow, nearly flat at the base, sessile. Acorn sub-globose.

In moist woods. April-May.

10. *Quercus imbricaria* Michx. SHINGLE OAK. Leaves oblong or lanceolate, entire, coriaceous, acute at both ends, short-petioled, bristle-tipped, dark green above, persistently brown-tomentulose beneath. Cup hemispheric or turbinate, 5"-7" broad, its bracts appressed. Acorn sub-globose.

Rich woods. April-May.

11. *Quercus alba* L. WHITE OAK. Leaves obovate in outline. Green above, pale and more or less glaucous beneath, thin, pinnatifid into 3-9 oblong, obtuse, ascending, toothed or entire lobes. Cup depressed-hemispheric, 7"-10" broad, its bracts thick, obtuse, woolly or at length glabrate, closely appressed. Acorn ovoid-oblong, 3-4 times as high as the cup.

In woods. May-June.

12. *Quercus stellata* Wang. POST OAK. Leaves broadly obovate in outline, deeply lyrate-pinnatifid into 3-7 broad, rounded, often deeply undulate or toothed, lobes; when mature firm, glabrous, dark green and shining above, brown tomentulose beneath. Cup hemispheric, 6"-8" broad, base narrowed, its bracts lanceolate, sub-acute, slightly squarrose. Acorn ovoid, 2-3 times as long as the cup.

In dry soil. May-June.

13. *Quercus lyrata* Walt. OVERCUP POST OAK. Leaves obovate in outline, mostly narrowed at the base, lyrate-pinnatifid or lobed to beyond the middle, thin, densely white-tomentulose or becoming glabrate beneath, the lobes lanceolate or oblong, rounded or sub-acute, entire or toothed, the upper pair the larger and usually divergent.

Cup depressed-globose, its bracts broad, thin, cuspidate. Acorn depressed-globose, $\frac{1}{2}$ '- $1\frac{1}{2}$ ' high, nearly or quite immersed in the cup.

In swamps or along streams. April-May.

14. *Quercus macrocarpa* Michx. MOSSY-CUP or BUR OAK. Leaves obovate or oblong-obovate in outline, rather thin, irregularly lobed, pinnatifid, or some coarsely crenate. Cup hemispheric or sub-globose, 8"-2' in diameter, its bracts floccose, thick, hard, ovate or forming a fringe around the acorn. Acorn ovoid, 1-2 times as high as the cup.

In rich soil. May-June.

15. *Quercus bicolor* Willd. SWAMP WHITE OAK. Leaves obovate, or oblong-obovate, coarsely toothed or sometimes lobed nearly to the middle, narrowed or rounded at the base, firm. Cup hemispheric, its bracts pubescent, lanceolate, appressed, the lower obtuse, the upper acute or acuminate. Acorn oblong-ovoid.

In moist or swampy soil. May-June.

16. *Quercus Michauxii* Nutt. BASKET OAK. Leaves obovate or broadly oblong, apex acute or acuminate, base narrowed, rounded or sub-cordate, sharply toothed, the teeth acute or mucronulate. Cup depressed-hemispheric, its bracts thick, ovate or lanceolate, appressed, acorns ovoid, about 3 times as high as the cup.

In moist soil. April-May.

17. *Quercus Prinus* L. ROCK CHESTNUT OAK. Leaves coarsely crenate, oblong, oblong-lanceolate or obovate. Cup hemispheric, its bracts tomentose, triangular-ovate, acute or cuspidate, appressed. Acorn ovoid, 2-3 times as high as the cup.

In dry soil. May-June.

18. *Quercus Muhlenbergii* Engelm. CHESTNUT or YELLOW OAK. Leaves oblong, lanceolate or obovate, apex acuminate or acute, base narrowed or rounded, coarsely toothed. Cup hemispheric, its bracts floccose, ovate, acute or cuspidate, appressed. Acorn ovoid, about twice as high as the cup.

In dry soil. May-June.

19. *Quercus prinoides* Willd. SCRUB or DWARF CHESTNUT OAK. A shrub, 2°-15° tall, sometimes tree-like. Leaves obovate, coarsely toothed, mostly acute or short-acuminate at the apex, narrowed at the base, the teeth short, triangular, sub-acute or obtuse. Cup hemispheric, thin, its bracts floccose, triangular-ovate or oblong-lanceolate, appressed. Acorn ovoid, obtuse, 2-3 times as long as the cup.

In dry sandy or rocky soil. April-May.

20. *Quercus virginiana* Mill. LIVE OAK. Leaves evergreen, coriaceous, oblong, elliptic or oblanceolate, apex obtuse, base narrowed or rounded, entire, or with a few bristle-tipped teeth. Cup turbinate, its bracts closely appressed, ovate or lanceolate. Acorn ovoid-oblong.

In dry soil. March-April.

FAMILY 13. ULMACEÆ. ELM FAMILY.

Trees or shrubs with watery juice. Alternate, simple, petiolate, serrate, stipulate leaves, which are usually 2-ranked. Small, bi-sexual, or somewhat monœcious, apetalous flowers. Calyx of 3-9 sepals, which are distinct or partly united. Stamens as many as the sepals and opposite them. Ovary 1-2 celled. Styles 2, spreading. Fruit a key, nut, or drupe.

Flowers borne in clusters on twigs of the preceding season; fruit a samara, or nut-like.

Flowers mostly expanded before the leaves; calx 4-9-cleft; fruit a samara. **I. Ulmus.**

Flowers expanding with the leaves; calyx 4-5-cleft; fruit nut-like. **II. Planera.**

Flowers borne on twigs of the season, the pistillate mostly solitary; fruit a drupe. **III. Celtis.**

I. ULMUS L.

Trees with straight-veins, unsymmetrical, doubly serrate leaves. Stipules early deciduous. Flowers bi-sexual. Calyx bell-shaped, 4-9-cleft. Stamens slender, protruding. Ovary compressed. Styles 2, spreading. Fruit membranaceous flat, winged on the edge. Leaves smooth or slightly rough above; samara densely ciliate.

None of the branches corky-winged; samara-faces glabrous. **1. *U. americana*.**

Some of the branches corky-winged; samara-faces pubescent. **2. *U. alata*.**

Leaves very rough above; samara not ciliate; twigs not corky-winged. **3. *U. fulva*.**

1. *Ulmus americana* L. AMERICAN or WHITE ELM. Leaves oval or obovate, apex abruptly acuminate, base obtuse or obtusish, and very inequilateral, sharply and usually doubly serrate, smooth or

rough above, pubescent or becoming glabrous beneath, 2'-5' long, 1½'-3' wide. Flowers fascicled. Calyx 7-9-lobed, oblique, its lobes oblong, rounded. Samara ovate-oval, reticulate-veined, 5"-6" long, its faces glabrous, its margins densely ciliate.

In moist soil and along streams. Common. March-April.

2. *Ulmus alata* Michx. WINGED ELM. WAHOO. A small tree with branches corky-winged. Leaves small, ovate-lanceolate, acute, sharply serrate, base nearly equal-sided, rough above, downy beneath, nearly sessile. Flowers in small clusters. Fruit oblong, downy on the sides, ciliate on the edges.

On rich soil. March. Occasionally producing a second set of flowers and fruit from September-November.

3. *Ulmus fulva* Michx. SLIPPERY ELM. Leaves large, thick, very rough above, downy beneath, ovate or obovate, taper-pointed at the apex, unsymmetrical, obtuse or somewhat cordate at the base, coarsely and doubly serrate. Calyx lobes and pedicels downy. Fruit broadly oval, downy over the seed, the twig smooth. Inner bark very fragrant when dried.

Along streams. March-April.

II. *PLANERA* J. F. Gmel.

Flowers monœcious or polygamous. Calyx 4-5-cleft. Stamens 4-5. Ovary ovoid, 1-celled, 1-ovuled, with 2 spreading styles which are stigmatose down the inner side, in fruit becoming coriaceous. Trees with small leaves, like those of the elms, the flowers appearing with them in small, axillary clusters.

1. *Planera aquatica* (Walt.) J. F. Gmel. WATER ELM. Nearly glabrous. Leaves ovate-oblong, small. Fruit stalked in the calyx, beset with irregular rough projections.

Swamps. Eastern parts of the state. April-May.

III. *CELTIS* L.

Trees or shrubs with entire or serrate, petioled leaves. Flowers greenish, axillary, on wood of the same season, the staminate in small clusters, the fertile single or 2-3 together.

Leaves ovate to ovate-lanceolate, drupe 4"-5" in diameter. 1. *C. occidentalis*.

Leaves lanceolate to ovate lanceolate, drupe 3"-4" in diameter. 2. *C. mississippiensis*.

1. *Celtis occidentalis* L. HACKBERRY. A large or medium-sized tree, having much the appearance of an elm, bark dark and rough. Leaves ovate, taper pointed at the apex, abruptly obtuse and inequilateral at the base, smooth above, usually somewhat downy below. Fruit a small, dark purple drupe.

On rich soil. Common. April-May.

2. *Celtis mississippiensis* Bosc. SOUTHERN HACKBERRY. A tree, bark gray, often very warty. Leaves broadly lanceolate or ovate, long-taper-pointed at the apex, obtuse or sometimes heart-shaped at the base, entire or with very few serratures, smooth on both sides, 3-nerved. Fruit a purplish-black, globose drupe.

In dry soil. April.

FAMILY 14. MORACEÆ. MULBERRY FAMILY.

Trees, shrubs, or herbs, usually with milky juice, alternate leaves, large, deciduous stipules, and small monœcious, or diœcious flowers crowded in spikes, heads, or racemes, or inclosed in a fleshy receptacle. Staminate flowers with a usually 4-lobed calyx, and with as many stamens opposite the lobes. Filaments usually inflexed in the bud, straightening at maturity. Pistillate flowers usually 4-sepalous. Ovary 1-2-celled, 1-2-ovuled. Styles 2. Receptacle and perianth often fleshy at maturity.

Staminate and pistillate flowers spiked; leaves dentate or lobed.

I. *Morus*.

Staminate flowers racemose or spiked; pistillate capitate.

Pistillate perianth deeply 4-cleft; leaves entire.

II. *Toxylon*.

Pistillate perianth 3-4 toothed; leaves various.

III. *Papyrius*.

I. *MORUS* (Tourn.) L.

Trees or shrubs with milky juice. Flowers monœcious or diœcious, the staminate and pistillate flowers on separate spikes, the pistillate spikes becoming juicy, aggre-

gate fruits. Stamens 4. Perianth 4-parted, persisting in the pistillate flowers and becoming fleshy, and inclosing the ovary, in the fruit.

1. **Morus rubra** L. RED MULBERRY. A small tree. Leaves ovate or nearly orbicular in outline, scabrous above, persistently pubescent beneath, acuminate at the apex, rounded, truncate or cordate at the base, serrate-dentate or 3-7-lobed. Staminate spikes drooping. Pistillate spikes spreading or pendulous in fruit, dark purple-red, delicious.

In rich soil. April-May. Common.

II. TOXYLON Raf.

A small tree with milky juice. Leaves alternate, petioled, spines axillary. Flowers diœcious. Staminate flowers in short axillary racemes. Calyx 4-parted. Stamens 4, inflexed in the bud. Pistillate flowers in axillary, peduncled, capitate clusters. Calyx 4-parted. Ovary sessile. Style long. Calyxes becoming thickened and fleshy in fruit and aggregated into a large, dense, globular head.

1. **Toxylon pomiferum** Raf. OSAGE ORANGE, BOIS D'ARC. Leaves ovate, ovate-lanceolate or ovate-oblong, glossy, entire, apex acuminate, base obtuse, truncate or subcordate. Syncarp globose, yellowish-green, tubercled.

In rich soil. June and May.

III. PAPYRIUS Lam.

Trees, with milky juice, the leaves alternate, petioled, entire, serrate, or 3-5-lobed, 3-nerved at the base. Flowers diœcious, the staminate in cylindric, ament-like spikes, the pistillate capitate. Staminate flowers with a deeply 4-cleft perianth, 4 stamens. Pistillate flowers with an ovoid or tubular 3-4-toothed perianth, a stalked ovary and a 2-cleft style. Head of the fruit globular, the drupes red.

1. **Papyrius papyrifera** (L.) Kuntze. PAPER MULBERRY. A small tree. Leaves mostly ovate, thin, long-petioled, serrate nearly all around, often deeply 3-lobed, sinuses rounded.

Escaped from cultivation. May-June.

FAMILY 15. LORANTHACEÆ. MISTLETOE FAMILY.

Parasitic green shrubs or herbs, containing chlorophyll, growing on woody plants and absorbing food from their sap, through specialized roots called haustoria. Leaves opposite. Flowers regular. Fruit a berry.

I. PHORADENDRON Nutt.

Evergreen, shrubby plants, parasitic on trees (especially elm in our territory). Branches greenish, jointed, and very brittle. Leaves leathery. Flowers diœcious, in short, jointed spikes. Staminate flowers globular, calyx 2-4-lobed, stamens sessile at the base of the lobes, anthers transversely 2-celled. Stigma sessile. Berry 2-seeded.

1. *Phoradendron flavescens* (Pursh.) Nutt. AMERICAN MISTLETOE. Leaves oblong or obovate. Berry globose, white. May-July.

FAMILY 16. SANTALACEÆ. SANDALWOOD FAMILY.

Herbs, shrubs, or trees, with entire leaves. The 4-5-cleft calyx valvate in the bud, its tube coherent with the 1-celled ovary. Ovules 2-4, suspended from the apex of a stalk-like free central placenta which rises from the base of the cell, but the (indehiscent) fruit always 1-seeded.

I. COMANDRA Nutt.

Erect, perennial herbs, sometimes growing parasitically on the roots of other plants. Stamens 5, rarely 4, inserted at the base of the lobes of the campanulate or urn-shaped calyx, and between the lobes of a fleshy disk. Anthers connected to the middle of the calyx lobes by tufts of hairs. Globose fruit surmounted by the persistent calyx.

1. *Comandra pallida* A. DC. PALE COMANDRA. Leaves linear or linear-lanceolate. Flowers cymose-clustered. Fruit ovoid-oblong. In dry soil. Blaine and Comanche counties. April-July.

FAMILY 17. POLYGONACEÆ. BUCKWHEAT FAMILY.

Herbs with alternate, entire leaves, and usually with sheathing stipules above the swollen joints of the stem. Flowers apetalous, generally bi-sexual, with a 3-6-cleft calyx, generally colored and persistent. Fruit a compressed or 3-angled achene, inclosed in the calyx. Seeds with endosperm, which does not generally enclose the embryo. Stamens 4-12, on the base of the calyx.

Stigmas tufted; sepals of the inner row usually accrescent.

Calyx 6-parted; style 3-parted; achene 3-angled.

I. Rumex.

Stigmas capitate, 2-cleft or toothed; sepals of the outer row often accrescent or reflexed.

II. Polygonum.**I. RUMEX L.**

Annual or perennial herbs with grooved and usually branched stems of various habits. Leaves entire or undulate, flat or crisped. Ocreæ cylindrical and fugacious. Inflorescence of simple or compound racemes. Calyx 6-parted, the inner 3 parts usually developing into wings in the fruit. Stamens 6. Style 3-parted. Flowers greenish, small, crowded in paniced racemes.

1. Leaves hastate; flowers diœcious; foliage acid; low species.

A. Inner sepals not developing wings in fruit; achene granular. 1. *R. Acetosella*.

2. Leaves not hastate; flowers perfect or polygamodiœcious; foliage scarcely or not at all acid; tall species.

- A. Leaves flat; bright or light green, or glaucescent.
Wings $\frac{1}{2}$ '- $1\frac{1}{2}$ ' broad, reddish; no tubercles.

2 *R. venosus*.

Wings small, not red, bearing tubercles.

Tubercles usually 3; Pedicels several times longer than the wings. 3. *R. verticillatus*.

Tubercle usually 1; pedicels equaling the wings.

4. *R. altissimus*.

- B. Leaves wavy-margined or crisped, dark green, not glaucescent.

Wings entire, more or less undulate. 5. *R. crispus*.

Wings toothed or fringed.

6 *R. obtusifolius*.

1. **Rumex Acetosella** L. SHEEP SORREL. Annual or perennial, glabrous, dioecious, stem slender, erect or nearly so, simple or branched, the rootstock woody, horizontal or creeping. Leaves narrowly hastate, obtuse or acute at the apex, the basal auricles entire, or 1-2-toothed. Ocreæ silvery, 2-parted, soon lacerate. Flowers in erect, paniced racemes. Achene less than 1" long, very granular, exceeding the persistent calyx, its angles not margined.

In dry fields and on hillsides. Caddo, Lincoln and Oklahoma counties. May-September.

2. **Rumex venosus** Pursh. VEINED or WINGED DOCK. Perennial by woody rootstocks, glabrous. Stem rather stout, erect, somewhat flexuous, 6'-15' tall, grooved and branched. Leaves ovate, ovate-lanceolate or oblong, 1'-5' long, acute at both ends or acuminate at the base, petioled, rather coriaceous. Ocreæ funnel-form, thin, brittle. Racemes mostly erect. Calyx red, pedicelled, very conspicuously winged in fruit. Wings large, $\frac{1}{2}$ '- $1\frac{1}{2}$ ' broad, suborbicular with a deep sinus at the base, veiny, reddish. Achene 3" long, smooth, shining, its faces concave, its angles margined.

Dry soil. Oklahoma County. May-August.

3. **Rumex verticillatus** L. SWAMP DOCK. Perennial, glabrous, rather bright green. Stem stout, grooved, erect, ascending or decumbent, 2°-5° long. Leaves narrowly oblong, oblong-lanceolate or lanceolate, 2'-12' long, narrowed at both ends or obtusish at the apex, slightly papillose, long-petioled. Wings broadly deltoid, 2" long, each bearing an ovoid tubercle. Achene $1\frac{1}{4}$ " long, reddish, pointed, smooth, shining, its faces concave.

In swamps. Garfield County. May-July.

4. **Rumex altissimus** Wood. TALL or PALE DOCK. Perennial,

glabrous, rather pale green. Stem stout, erect, grooved, 2°-4° tall. Leaves lanceolate, oblong-lanceolate or ovate-lanceolate, acute at both ends, papillose. Calyx light green, 1" long, winged in fruit. Wings triangular-cordate, 2"-2½" long, usually only one of them bearing an ovoid tubercle. Achene 1½" long, dark red, smooth, shining, its faces concave.

Moist soil. Common. April-June.

5. *Rumex crispus* L. CURLED or YELLOW DOCK. Perennial, glabrous, dark green, stem rather slender, erect, grooved, 12'-42' tall. Leaves crisped and wavy-margined, the lower oblong or oblong-lanceolate, 6'-12' long, the upper narrowly oblong or lanceolate, 3'-6' long, all cordate or obtuse at the base, more or less papillose. Wings cordate, 1½"-2" long, truncate or notched at base, erose-dentate or nearly entire, each bearing a tubercle. Achene 1" long, dark brown, shining.

Waste places. Common. May-July.

6. *Rumex obtusifolius* L. BROAD-LEAVED or BITTER DOCK. Perennial, glabrous, dark green. Stem stout, erect, grooved, more or less scurfy above, 24'-48' tall. Lower leaves oblong-lanceolate, 6'-14' long, all cordate or rounded at the base, obtuse or acute at the apex, the upper lanceolate or oblong-lanceolate, 2'-6' long, the margins somewhat undulate or crisped. Wings hastate, 2"-2½" long, fringed with a few, spreading, spiny teeth, one of them bearing an oblong tubercle. Achene 1" long, pointed, dark red, smooth, shining, its angles slightly margined.

In waste places. May-August.

II. *Polygonum* (Tourn.) L.

Annual or perennial, with enlarged joints and simple, alternate, entire leaves. The sheathing stipules often cut or fringed. Flowers bi-sexual, usually white or rose-colored. Each flower or cluster subtended by a membranaceous bract similar to the stipules of the leaves. Calyx mostly 5-parted, the divisions petal-like, erect and persistent. Stamens 3-9. Styles 2-3-parted. Fruit lens-shaped or 3-angled.

1. *Polygonum aviculare* L. KNOT-GRASS. Annual, pale green or bluish green. Stem low or ascending, 4'-24' long. Leaves broad, oblong to obovate-oblong, 13"-20" long, narrowed at the base, usually acute at the apex or sometimes obtuse. Ocreæ silvery. Clusters 1-5-flowered. Achene 3-angled, ovoid, 1½"-2" long, acute, striate, reticulated.

In dooryards and where the ground is trampled. May-September. Common.

FAMILY 18. CHENOPODIACEÆ. GOOSEFOOT FAMILY.

Herbs or shrubs. Leaves simple, alternate, without stipules. Flowers small, actinomorphic, either bi-sexual or more or less monœcious or diœcious. Calyx free from the ovary. Corolla wanting. Stamens usually 5 opposite the sepals. Styles or stigmas generally 2. Fruit with one seed usually inclosed in a small, bladdery sac, sometimes an achene.

I. MONOLEPIS Schrad.

Flowers small, glomerate in the upper axils. Sepal 1, green, entire, bract-like, fleshy, obtuse. Utricle moderately flattened. Seed vertical, much compressed.

1. Monolepis Nuttalliana (R. & S.) Greene. Branched from the base, 3'-12' high, somewhat fleshy, rather pale green, scarcely or not at all mealy. Leaves lanceolate in outline, short-petioled, or the upper sessile, 6"-18" long, narrowed at the base, 3-lobed, the middle lobe linear or linear-oblong, acute or acuminate. Flowers clustered in the axils. Pericarp minutely pitted.

In alkaline or dry soil. Common. May-August.

FAMILY 19. NYCTAGINACEÆ. FOUR-O'CLOCK FAMILY.

Herbs with simple, entire leaves, and regular flowers on terminal or axillary clusters, subtended by involucre of distinct or united bracts. Petals none. Calyx inferior, usually corolla-like, its limb campanulate, tubular or salver-form, 4-5-lobed or 4-5-toothed. Stamens hypogynous. Ovary enclosed by the tube of the perianth, sessile or stipitate, 1-celled, 1-ovuled. Fruit a ribbed, grooved or winged anthocarp.

I. ALLIONIA Loeffl.

Forking herbs, with opposite, equal leaves, and involucre in loose terminal panicles or solitary in the axils

of the leaves. Involucre 5-lobed, becoming enlarged and reticulate-veined after flowering. Perianth campanulate, its tube constricted above the ovary, its limb corolla-like, deciduous. Stamens 3-5, generally 3, unequal, hypogynous. Fruit obovoid or clavate, strongly ribbed, pubescent in most species.

Leaves sessile or nearly so, lanceolate to oblong.

1. *A. albida*.

Leaves manifestly petioled, ovate, often cordate.

2. *A. nyctaginea*.

1. **Allionia albida** Walt. PALE UMBRELLA-WORT. Stem erect, furrowed or striate, 4-sided below, 12'-36' tall, glabrous or short-pubescent above, or pubescent to the base, the peduncles and branches commonly glandular and viscous. Leaves lanceolate or oblong-lanceolate, 3-veined from the base, glabrous, pubescent or ciliate. Involucre much enlarged in fruit, pubescent, ciliate, becoming whitish and purple-veined. Perianth pink, white or lilac. Fruit with hispid ribs, roughened in the furrows.

In dry soil. May-August.

2. **Allionia nyctaginea** Michx. HEART-LEAVED UMBRELLA-WORT. Stems angled, often 4-sided below, glabrous or slightly pubescent, 12'-36' tall. Leaves broadly ovate to oblong, acute at the apex, cordate, rounded, truncate or narrowed at the base. Peduncles and pedicels commonly pubescent. Involucre shorter than the flowers. Perianth red. Fruit oblong or narrowly obovoid, very pubescent.

In dry soil. Common. May-August.

FAMILY 20. AIZOACEÆ. CARPET-WEED FAMILY.

Mostly fleshy herbs, mainly natives of Africa. Stems prostrate and branching, with opposite or verticillate leaves and solitary, cymose, or glomerate perfect, small, regular flowers. Ovary usually free from the calyx, 3-5-celled, and ovules numerous in each cell.

I. MOLLUGO L.

Low, branching annuals. Sepals 5, greenish outside, white inside. Corolla wanting. Stamens 5, alternate with

the sepals, or 3, alternate with the cells of the ovary. Capsule 3-celled, many-seeded.

1. **Mollugo verticillata** L. CARPET-WEED. Stems branching and forming radiating patches. Leaves clustered in apparent whorls at the joints of the stem, spatulate. Flowers in little sessile umbels at the joints. Stamens commonly 3. Ovary ovoid or globose, usually 3-celled. Capsule usually 3-celled, 3-valved. Seeds small, the testa smooth, granular or sculptured.

In waste places and cultivated grounds. May-September. Common.

FAMILY 21. PORTULACACEÆ PURSLANE FAMILY.

Herbs. Leaves opposite or alternate, entire. Stipules dry and membranaceous. Sepals 2. Petals 4 or more, distinct or united below. Stamens 4 or more, hypogynous or perigynous. Ovary usually superior, 1-celled. Style simple or 3-cleft. Ovules 2-many. Capsule circumscissile, or dehiscent by 3 valves.

Seeds numerous; stamens 5-many.

I. **Talinum.**

Seeds not more than 6; stamens 2-5.

II. **Claytonia.**

I. TALINUM Adans.

Fleshy, glabrous, erect or ascending, perennial or annual herbs, with scapose or leafy stems, alternate, terete or flat, ex-stipulate leaves, clustered at the base, and mainly cymose, racemose, or paniced flowers. Sepals 2, ovate. Petals 5, hypgynous, fugacious. Capsule ovoid, oval or globose, 3-valved.

Flowers 4"-8" broad; sepals deciduous.

Stamens 10-30; capsules globose. 1. *T. teretifolium*.

Stamens only 5; capsule oval. 2. *T. parviflorum*.

Flowers 10"-15" broad; sepals persistent.

3. *T. calycinum*.

1. **Talinum teretifolium** Pursh. FAME-FLOWER. Perennial, erect, 4'-12' high, leafy at the base. Leaves linear, terete. Scape-like peduncles 1-5, terminal, branched, leafless, slender, bracted at the nodes. Cymes terminal, loose, the branches ascending or divaricate.

Flowers pink, 6"-8" broad. Capsule globose, 2" in diameter. Bracts of the cyme ovate or ovate-lanceolate, 1" long, prolonged posteriorly.

On dry rocks. May-August. Common.

2. *Talinum parviflorum* Nutt. SMALL-FLOWERED TALINUM. Perennial. Leafy below. Leaves terete or nearly so, linear, broadened at the base. Scape-like peduncle very slender, 3'-8' tall. Cymes loose, their branches and pedicels ascending. Flowers pink, 4"-5" broad. Capsule lanceolate, slightly prolonged posteriorly.

In dry soil. May-September. Common.

3. *Talinum calycinum* Engelm. LARGE-FLOWERED TALINUM. Perennial, erect from a very thick root, slender, 6'-10' high. Leaves nearly terete, clustered at the base, the base triangular-broadened. Cyme terminal, somewhat compound, scarious bracted, its branches ascending. Flowers pink, 10"-15" broad. Stamens 12-30. Capsule globose-ovoid, about 3" in diameter.

In dry soil. May-June.

II. CLAYTONIA (Gronov.) L.

Perennial, succulent, glabrous herbs, with corms, or thick rootstocks, petioled basal leaves, and opposite or alternate cauline ones. Flowers terminal, racemose. Sepals 2, ovate, persistent. Petals 5, hypogynous, distinct. Stamens 5, inserted on the bases of the petals. Ovary few-ovuled. Style 3-lobed or 3-cleft. Capsule ovoid or globose, 3-valved, 3-6-seeded.

1. *Claytonia virginica* L. SPRING BEAUTY. Ascending or decumbent, perennial from a deep, tuberous root. Leaves linear or linear-lanceolate, narrowed into a petiole, the basal 3'-7' long, the cauline shorter and opposite. Raceme terminal, loose, somewhat secund. Flowers white or pink, with darker pink veins. Capsule shorter than the sepals.

Roadsides, woods, prairies. March-May. Common.

FAMILY 22. ALSINACEÆ. CHICKWEED FAMILY.

Annual or perennial herbs with opposite, entire leaves, stipules small and dry or none, and mostly small, perfect flowers, solitary or in cymes or umbels. Calyx of 4 or 5 sepals, separate to the base, or nearly so. Petals as many as the sepals, rarely wanting. Stamens twice as

many as the sepals, or fewer, inserted at the base of the sessile ovary, or on a small disk. Ovary usually 1-celled. Styles 2-5, distinct. Ovules several or numerous on a central placenta. Fruit a capsule.

Petals deeply 2-cleft or 2-parted.

Capsule ovoid or oblong, dehiscent by valves.

I. Alsine.

Capsule cylindric, commonly curved, dehiscent by teeth.

II. Cerastium.

Petals entire or emarginate.

Styles as many as the sepals, alternate with them.

III. Sagina.

Styles fewer than the sepals.

IV. Arenaria.

I. ALSINE (Tourn.) L.

Mostly annual, generally diffuse herbs, with cymose, white flowers. Capsule globose, oval, or oblong. Seeds smooth or roughened, globose or compressed.

1. Alsine media L. COMMON CHICKWEED. Annual, weak, tufted, much branched, decumbent or ascending, 4'-16' long, glabrous except a line of hairs along the stem and branches, the pubescent sepals and the sometimes ciliate petioles. Leaves ovate or oval, acute or rarely obtuse, the lower often cordate, 2"-1½' long. Flowers 2"-4" broad, in terminal leafy cymes or also solitary in the axils. Sepals oblong, mostly acute, longer than the 2-parted petals. Capsule ovoid, longer than the calyx. Seeds rough, sometimes crested.

In waste places, meadows, and woods. Common. January-December.

II. CERASTIUM L.

Annual or perennial. Stems diffuse, usually downy. Leaves opposite. Flower white, peduncled, in terminal, regularly forking cymes. Sepals 4-5. Petals 4-5, notched or 2-cleft. Stamens 10. Styles 5 or less. Capsules cylindrical, 1-celled, many-seeded.

Pedicels much longer than the calyx.

1. *C. longipedunculatum*.

Pedicels shorter than or but little exceeding the calyx.

2. *C. brachypodum*.

1. ***Cerastium longipedunculatum* Muhl. NODDING CHICKWEED.** Annual, stem weak, reclining or ascending, diffusely branched, 6'-24' long, striate, finely clammy-pubescent to glabrate. Lower and basal leaves spatulate, obtuse, petioled, $\frac{1}{2}$ '-1' long, those of the middle part of the stem lanceolate or oblong. Inflorescence loosely cymose. Flowers 2"-3" broad. Pods nodding, 5"-9" long, curved upward, much exceeding the calyx.

In moist, shaded places. April-June.

2. ***Cerastium brachypodum* (Engelm.) Robinson. SHORT-STALKED CHICKWEED.** Annual. Stems 3'-10' high, clammy-downy. Lower leaves oblanceolate or spatulate, the upper ones linear to lanceolate. Pedicels shorter or not much longer than the calyx. Petals longer than the sepals. Capsule straight or slightly curved upwards.

In dry soil. March-July. Common.

III. SAGINA L.

Tufted, matted, low annual or perennial herbs, with subulate leaves, and small, pedicelled, whitish flowers. Sepals 4 or 5. Petals of the same number, entire, emarginate or none. Stamens of the same number, or fewer, or twice as many. Ovary 1-celled, many ovuled. Styles as many as the sepals and alternate with them. Capsule 4-5-valved, the valves opposite the sepals.

1. ***Sagina decumbens* (Ell.) T. & G. DECUMBENT PEARLWORT.** Annual. Stems decumbent, erect or ascending, 2'-4' long, glabrous or minutely glandular-pubescent above. Leaves narrowly linear, sometimes bristle-tipped, 3"-5" long. Peduncles filiform, 3"-15" long. Flowers 1"-1 $\frac{1}{2}$ " broad. Sepals, petals, and styles 5. Pod ovoid-oblong, nearly twice as long as the calyx. Seeds with resinous glands.

In dry soil. March-May. Common.

IV. ARENARIA L.

Annual or perennial, mainly tufted herbs, with sessile leaves, and terminal, cymose, or capitate, rarely axillary, and solitary, white flowers. Sepals 5, petals 5, entire or scarcely emarginate, rarely none. Stamens 10. Styles gen-

erally 3. Ovary 1-celled, many-ovuled. Capsule globose or oblong. Seeds reniform-globose or compressed.

1. *Arenaria patula* Michx. PITCHER'S SANDWORT. Annual. Branched from the base, erect or ascending, 4'-10' high, finely pubescent or glabrous. Leaves soft, herbaceous, linear-filiform, 4"-12" long, $\frac{1}{2}$ " wide or less. Cyme terminal, several-flowered, diffuse. Sepals lanceolate, acuminate, 3-5-nerved. Seeds rough.

In open dry places. April-May. Common.

FAMILY 23. CARYOPHYLLACEÆ. PINK FAMILY.

Annual or perennial herbs, often swollen at the nodes, with opposite, entire leaves, and perfect, regular flowers, the sap watery. Sepals 4 or 5, united into a tube or cup. Petals equal in number to the sepals (rarely 0). Stamens twice as many as the sepals, perigynous. Ovary 1, stipitate, mainly 1-celled. Styles 2-5. Ovules and seeds several or many. Fruit a capsule.

I. SILENE L.

Annual or perennial herbs. Calyx more or less inflated, tubular, ovoid, or campanulate, 5-toothed, 10-nerved, bractless. Petals 5, clawed. Stamens 10. Styles 3. Ovary 1-celled or 3-celled at the base, opening by 6 teeth, many seeded. Seeds usually roughened.

1. *Silene antirrhina* L. SLEEPY CATCHFLY. Annual, erect, puberulent or glabrous, glutinous about the nodes, 8'-30' high. Basal and lower leaves spatulate or oblanceolate, 1'-2' long. Upper leaves linear and gradually reduced to subulate bracts. Inflorescence a loose, cymose panicle. Corolla pink, about 1"-2" broad. Calyx narrowly ovoid, much expanded by the ripening pod, its teeth ovate, acute. Petals obcordate, minutely crowned.

In waste places and woods. Common. May-July.

FAMILY 24. ANNONACEÆ. CUSTARD-APPLE FAMILY.

Trees or shrubs with alternate, entire, pinnately-veined

leaves. Stipules none. Sepals 3. Petals about 6, arranged in 2 series. Stamens many. Anthers adnate, extrorse. Carpels many.

I. ASIMINA Adans.

Small trees, or shrubs, with alternate leaves and lateral or axillary nodding flowers. Buds naked. Sepals 3, ovate. Petals 6, arranged in 2 series, those of the outer series larger when mature. Stamens and carpels 3-15. Fruit large, fleshy, oblong berries.

1. *Asimina triloba* (L.) Dunal: NORTH AMERICAN PAPAW. A tall shrub or tree. Leaves obovate, acute, cuneate or rounded at the base. Flowers axillary, on shoots of the preceding year, appearing with the leaves, dark purple. Sepals ovate, densely dark-pubescent. Fruit 3'-7' long, 1'-2' thick, sweet and edible, and brown when ripe.

Along streams, eastern part of state. March-April.

FAMILY 25. RANUNCULACEÆ. CROWFOOT FAMILY.

Herbs, annual or perennial, with acrid sap. Leaves basal or alternate (except in Clematis). Stipules none or adnate to the petiole. Floral organs all distinct and unconnected. Sepals 5 or more, falling early, often petal-like. Petals none, or 5 or more. Stamens many. Carpels many, 1-celled. Stigmas simple. Ovules 1 or more. Fruit 1-seeded achenes or many-seeded follicles. Seeds small.

Carpels several-ovuled; fruit a follicle or berry; sepals imbricated in the bud.

Flowers regular; leaves palmately nerved or palmately compound.

I. *Hydrastis*.

Flowers irregular.

II. *Delphinium*.

Carpels 1-ovuled; fruit an achene.

Flowers subtended by involucre remote from the calyx or close to it.

III. *Anemone*.

Flowers not subtended by involucre.

Small annual herbs; leaves basal linear; sepals spurred.

IV. *Myosurus*.

Low or tall herbs, mostly with both basal and stem leaves; sepals spurless.

V. *Ranunculus*.

Climbing vines.

VI. *Viorna*.

I. *HYDRASTIS*. Ellis.

Erect, perennial, pubescent herbs, with palmately-lobed reniform leaves, and small, solitary, greenish-white flowers. Sepals 3, petaloid. Petals none. Stamens numerous. Carpels many, each bearing 2 ovules near the middle, and in fruit forming a head of 1-2-seeded crimson berries, somewhat resembling a raspberry. Stigma flat.

1. *Hydrastis canadensis* L. ORANGE-ROOT. GOLDEN SEAL. Perennial from a thick, yellow rootstock. Basal leaf long-petioled, 5'-8' broad, palmately 5-9-lobed, sharply and unequally serrate. Cauline leaves 2, borne at the summit of the stem, the upper one subtending the greenish-white flower. Head of fruit ovoid, blunt, the fleshy carpels tipped with a short curved beak.

In woods. April.

II. *DELPHINIUM* L.

Annual or perennial herbs. Stem erect, simple or branched. Leaves alternate, petioled, palmately divided. Flowers in terminal racemes or panicles, showy. Sepals 5, colored, irregular, the upper one prolonged into a spur. Petals 4, unequal, the 2 upper ones with long spurs which are enclosed in the spur of the upper sepal, the other 2 short-stalked. Pistils 1-5; ovaries many-seeded.

Flowers bright blue; bractlets close to the calyx.

1. *D. carolinianum*.

Flowers bluish-white; bractlets distant from the calyx,

2. *D. virescens*.

1. **Delphinium carolinianum** Walt. CAROLINA LARKSPUR. Stem slender, more or less pubescent. Leaves deeply cleft into linear, toothed or cleft segments. Raceme terminal, 4'-8' long. Flowers pedicelled, blue, the spur curved upward, horizontal or nearly erect. Follicles 3, erect or slightly spreading, downy, tipped with a subulate beak. Seed coat rugose.

Prairies and open grounds. May-July.

2. **Delphinium virescens** Nutt. Perennial, with branched, woody roots, pubescent and often glandular. Leaf-segments linear, 1"-3" wide. Raceme narrow, rather densely flowered. Flowers white, or bluish-white, finely pubescent. Spur horizontal or ascending, 6"-8" long, straight, or slightly curved upward. Follicles 6"-9" long, erect, puberulent.

Prairies. May-July. Common.

III. ANEMONE L.

Erect, perennial herbs. Basal leaves lobed, divided or dissected, those of the stem forming an involucre near to or remote from the peduncled flowers. Sepals 4-20, petaloid. Petals none. Stamens many, shorter than the sepals. Carpels many. Achenes compressed, 1-seeded.

Involucre mostly above the middle of the scape; tips of the achene projecting beyond the wool.

1. *A. decapetala*.

Involucre mostly below the middle of the scape; tips of the achene projecting beyond the wool.

2. *A. caroliniana*.

1. **Anemone decapetala** Ard. Foliage finely pubescent. Root tuberous, oblong. Leaves few, blades 3-divided, the segments ovate or ovate-oblong, crenate or crenate-cleft. Scape erect, simple. Bracts of the involucre very different from the leaf-blades, nearly sessile, once or twice palmately cleft, the segments linear, mostly entire. Sepals 10-20, pink or greenish white. Head of fruit cylindric. Achenes completely buried in the wool.

On plains and prairies. April-July. Arbuckle Mountains.

2. **Anemone caroliniana** Walt. CAROLINA ANEMONE. Sparsely hairy, 4'-10' high, arising from a tuber. Basal leaves slender-petioled, 3-divided, the divisions variously toothed, lobed and parted, those of the involucre sessile and 3-cleft. Flower erect, 9"-18" broad. Sepals 6-20, linear-oblong, purple, varying to white. Head of fruit oblong. Achenes densely woolly.

Prairies. April-May. Common.

IV. MYOSURUS L.

Small, annual herbs, with fibrous roots, tufted, basal, linear or linear-spatulate, entire leaves and 1-flowered scape. Sepals 5, long spurred at the base. Petals the same number or none, when present greenish-yellow. Stamens 5-25, about equaling the sepals. Pistils numerous, borne on a central axis. Ovule one, suspended. Achenes apiculate or aristate.

1. *Myosurus minimus* L. MOUSE-TAIL. Low, glabrous, 1'-6' high, the scape at length surpassing the leaves and the elongated receptacle attaining the length of 1'-2'. Leaves all basal, 2'-4' long. Narrowly spatulate to linear, blunt. Petals present, small. Achenes glabrous, apiculate.

In moist places. April-July. Common.

V. RANUNCULUS (Tourn.) L.

Annual or perennial herbs. Leaves alternate, usually deeply-lobed or parted. Flowers axillary or in corymbs, white or yellow. Sepals 3-5. Petals 3-5, flat, with a small pit or scale inside at the narrowed base. Stamens usually numerous. Pistils few or several in a head. Achenes flattened, pointed.

1. *Ranunculus sceleratus* L. CELERY-LEAVED CROWFOOT. Stout, glabrous or nearly so, 6'-24' high, freely branching, stem hollow, sometimes 1¼' thick. Basal leaves thick, 3-5-lobed, on long and broad petioles, the blade 1'-2' broad, reniform or cordate, those of the stem petioled or the upper sessile, deeply lobed or divided. Flowers yellow, numerous 3"-4" broad, the petals about equaling the calyx. Head of the fruit oblong or cylindric.

In moist soil. April-August. Oklahoma County.

VI. VIORNA Reichb.

Vines or erect perennial herbs, with opposite, pinnately-compound or simple leaves. Flowers mostly solitary. Sepals 4 or 5, petal-like, erect or converging. Petals none. Stamens numerous, parallel with the sepals. Pistils numerous. Styles plumose or silky. Achenes flattish, the long styles persistent.

1. *Viorna Pitcheri* (T. & G.) Britton. PITCHER'S LEATHER-

FLOWER. A high climbing vine, the branches more or less pubescent. Leaves pinnate. Leaflets entire, lobed or trifoliate, thick, reticulate, generally mucronate. Flowers solitary. Calyx campanulate, purplish pubescent. Sepals with recurved margined tips.

Rich soil. May-August. Oklahoma to McCurtain counties.

FAMILY 26. PAPAVERACEÆ. POPPY FAMILY.

Annual or perennial herbs, often with milky juice. Leaves usually alternate without stipules. Flowers perfect, regular. Sepals usually 2, shed as the flower opens. Petals 4-12, falling early. Stamens many. Carpels 2-16. Fruit a capsule.

I. ARGEMONE L.

Glaucous herbs, with yellow sap, spiny-toothed leaves and large showy flowers. Sepals 2 or 3. Petals 4-6. Stamens many. Style very short or none. Stigma dilated, 3-6-radiate. Capsule prickly, oblong. Seeds numerous, cancellate.

Flowers distinctly peduncled; spines of the sepal-tips nearly erect. 1. *A. alba*.

Flowers sessile or nearly so; spines of the sepal-tips spreading. 2. *A. intermedia*.

1. **Argemone alba** Leatib. WHITE PRICKLY POPPY. Leaves pinnatifid or pinnately lobed, glaucous or green, not blotched, but sometimes whitish along the veins. Flowers white, 3'-4' broad, distinctly peduncled. Petals rounded. Spines of the sepal-tips stout. Capsule 1'-1½' long.

Dry prairies or plains. Common. May-August.

2. **Argemone intermedia** Sweet. LEAFY WHITE PRICKLY POPPY. Stem stout, prickly, glabrous and glaucous. Leaves lobed or pinnatifid, very prickly, usually whitish-blotched. Flowers large, white, sessile or nearly so, 3'-4' wide. Petals rounded. Spines of the sepal-tips spreading. Capsule oblong, prickly, about 1' long.

Prairies and plains. May-August.

FAMILY 27. FUMARIACEÆ. FUMEWORT FAMILY.

Annual, biennial or perennial herbs, with watery sap, dissected, alternate or basal leaves without stipules, and perfect, irregular flowers variously clustered. Sepals 2, scale-like. Petals 4, somewhat united, the 2 outer ones spreading above, one or both saccate or spurred at the base, the 2 inner smaller, narrower, thickened at the tips and united over the stigma. Stamens 6, diadelphous, hypogynous, in 2 sets of 3. Carpels 2, united into a single pistil, the ovary 1-celled. Stigma 2-lobed. Fruit a 2-valved, several-seeded capsule, or 1-seeded and indehiscent.

I. CAPNOIDES (Tourn.) Adans.

Erect or climbing herbs, with basal and cauline compound leaves, and racemose flowers, terminal, or opposite the petioles. Sepals 2, small. Corolla irregular. Petals 4, erect-connivent, one of the outer pairs spurred at the base, the interior ones narrow, keeled on the back. Stamens 6, in 2 sets, opposite the outer petals. Capsule linear or oblong, 2-valved.

Flowers 3"-4" long; spur short. 1. *C. Micranthum*.

Flowers 6"-8" long; spur conspicuous.

Pods smooth. 2. *C. Campestre*.

Pods densely covered with transparent vesicles.

3. *C. crystallinum*.

1. *Capnoides micranthum* (Engelm.) Britton. SMALL-FLOWERED CORYDALIS. Lower leaves slender-petioled, the upper nearly sessile, all finely dissected into linear or oblong, sometimes cuneate, acute or obtuse segments. Pods ascending, short pedicelled, torulose. Seeds obtuse-margined, smooth, shining.

In woods. February-April.

2. *Capnoides campestre* Britton. PLAINS CORYDALIS. Flowers spicate, racemose, about 8" long, conspicuous, bright yellow. Spur of the corolla blunt, nearly straight, 2"-2½" long. Pods curved upward, very short-pedicelled, stout, somewhat 4-sided. Seeds sharp-

margined, finely and distinctly reticulated. In fields and woods and sandy soil. April-June.

3. **Capnoides cryatallinum** (Engelm.) Kuntze. VESICULAR CORYDALIS. Erect or ascending, glabrous, 1'-20' high, branching. Lower leaves slender-petioled, the upper sessile, all finely dissected into oblong, or cuneate segments. Pedicels stout, short, diverging. Flowers spicate, 6"-8" long, bright yellow. Spur 3"-4" long. Crest large, dentate. Capsule 9" long, ascending or erect, densely covered with transparent vesicles. Seeds acute-margined, tuberculate-reticulate.

Prairies. April-June.

FAMILY 28. CRUCIFERÆ. MUSTARD FAMILY.

Herbs with pungent, watery juice, and alternate leaves without stipules. Sepals 4, often falling off early. Petals usually 4, arranged in form of a cross. Stamens 6, the 2 outer ones shorter than the 2 inner ones. Fruit a pod, divided into 2 cells by a thin partition.

Key to Genera of Cruciferæ.

1. Pods globose to linear, not greatly elongated nor very broad and flat.

Pubescence stellate, or of forked hairs.

Pubescence stellate, or the hairs 2-lobed.

Pods orbicular to linear, more or less flattened parallel to the broad partition. **I. Draba.**

Pods globose or di-dynamous, swollen.

II. Lesquerella.

Pubescence of forked hairs; pods little longer than wide.

Pods obovoid, swollen; flowers yellow.

III. Camelina.

Pods not swollen, flattened at right angles to the partition; flowers white. **IV. Bursa.**

Pubescence of simple hairs, or wanting.

Pods globose to oblong, scarcely or not at all flattened.

Flowers yellow, small.

V. **Radicula.**

Flowers white, large.

VI. **Sisymbrium.**

Pods short, strongly flattened at right angles to the narrow partition; flowers white or purplish.

Seeds solitary in each cell of the pod.

VII. **Lepidium.**

Seeds 2-several in each cell of the winged pod.

VIII. **Thlaspi.**

2. Pods elongated-linear, or large.

Cotyledons incumbent.

Stigma simple, not 2-lobed.

IX. **Sophia.**

Stigma 2-lobed, the lobes over the placentæ.

Leaves various, not cordate-clasping.

Pods 4-angled; hairs of the stem 2-forked with appressed branches.

X. **Cheirinia.**

Pods terete; pubescence, if present of simple hairs.

XI. **Norta.**

Leaves cordate-clasping, sessile, entire.

XII. **Conringia.**

Cotyledons accumbent.

XIII. **Arabis.**

I. **DRABA** (Dill.) L.

Low, tufted, mostly stellate-pubescent herbs, with scapose or leafy stems, simple leaves and mainly racemose flowers. Flowers white or yellow. Pods elliptic, oblong, or linear, flattened parallel with the partition. Seeds several in 2 rows in each cell.

Flowers white.

Leaves entire, obovate or oblong.

1. *D. caroliniana.*

Leaves dentate, cuneate.

2. *D. cuneifolia.*

Flowers yellow.

3. *D. brachycarpa.*

1. ***Draba caroliniana*** Walt. CAROLINA WHITLOW-GRASS. Winter annual. Flowers white. Petals entire. Pods linear, longer than the ascending pedicels. Flowering stems 1'-5' high. Leaves obovate and entire, clustered at the base, or only a short distance up the stem, beset with stellate pubescence.

In sandy fields. March-June. Common.

2. ***Draba cuneifolia*** Nutt. WEDGE-LEAVED WHITLOW-GRASS. Flowers white. Petals emarginate. Pods oblong-linear, minutely hairy, longer than the horizontal pedicels. Flowering stems 4'-8' high, branching and leafy below. Leaves obovate, cuneate, or the lowest spatulate, dentate toward the summit.

In fields. February-April. Common.

3. ***Draba brachycarpa*** Nutt. SHORT-FRUITED WHITLOW-GRASS. Flowers yellow. The oblong pods 1"-2" long. Basal leaves 4"-6" long, ovate or obovate, stem leaves oblong and entire.

Dry hills and fields. March-May. Common.

II. LESQUERELLA S. Wats.

Low, annual or perennial herbs, with stellate pubescence, simple leaves, and racemose, mainly yellow, flowers. Petals entire. Pod generally inflated, globose or oblong. Valves nerveless. Seeds few or several, in 2 rows, flat. Cotyledons accumbent.

Annual.

Filaments more or less dilated below; foliage hispidly stellate.

1. *L. densiflora*.

Filaments very slender or linear-subulate; foliage compactly canescent or scaly-stellate.

2. *L. gracilis*.

Perennial.

3. *L. ovalifolia*.

1. ***Lesquerella densiflora*** (A. Gray) S. Watts. Densely canescent annual. Stem branched at base, 4'-12' long. Leaf blades spatulate to lanceolate or oblong, entire or repand, the lower with petioles, the upper sessile. Corymbs rather densely flowered. Pedicels 3"-5" long, ascending. Petals broadly spatulate, 4"-5" long. Filaments slightly dilated for 1-3 their length. Pods sub-globose, 2" in diameter, glabrous.

In dry soil. May-June. Southern.

2. ***Lesquerella gracilis*** (Hook.) S. Watts. SLENDER BLADDER-POD. Slender, sparingly stellate-pubescent annual, much branched, 10'-24' tall. Leaves linear or oblanceolate, the lower slightly petioled, the

upper sessile, their margins often undulate. Flowers yellow. Pod globose, glabrous, 2" in diameter. Seeds several in each cell.

Prairies. March-May.

3. *Lesquerella ovalifolia* Rydb. OVAL-LEAVED BLADDER-POD. Perennial from a tufted caudex, pale, densely stellate-canescens. Basal leaves tufted, broadly oval to obovate, sometimes nearly orbicular, entire, obtuse or sub-acute, narrowed into rather long petioles. Stem-leaves distant, sessile, or the lowest short-petioled, linear-oblongate or narrowly-spatulate. Pods very short-stipitate, sub-globose, obtuse, glabrous.

In dry soil. April-June. Arbuckle and Wichita Mountains.

III. CAMELINA Crantz.

Erect, annual herbs, with entire, toothed or pinnatifid leaves, and small, yellowish flowers. Silicles obovoid or pear-shaped, slightly flattened. Valves convex, 1-nerved. Seeds several or numerous in each cell. Stigma entire. Style slender.

1. *Camelina microcarpa* Andr. SMALL-FRUITED FALSE-FLAX. Stem pubescent, simple or with few elongated branches. Leaves lanceolate, sessile, auricled, or the lower narrowed at the base. Fruiting racemes much elongated. Pods flattened 2"-3" long, strongly margined.

In waste places. May-July. Oklahoma and Cleveland counties.

IV. BURSA (Siegb.) Weber.

Annual or winter annual herbs, pubescent with forked hairs. Pod obcordate-triangular, flattened contrary to the partition. The turgid valves 1-nerved. Seeds several, shorter than the spreading pedicels. Petals small, white.

1. *Bursa Bursa-pastoris* (L.) Britton. SHEPHERD'S-PURSE. Root long and straight. Stem branching above, downy below, smooth above. Lower leaves forming a rosette at the base of the stem, irregularly lobed or pinnately cut. Stem leaves lanceolate, clasping, toothed or entire. Sepals downy, about one-half as long as the petals. Pod triangular, notched, or cordate at the apex.

In fields and waste places. Very common. January-December.

V. RADICULA Hill.

Herbs, with simple or pinnate-lobed dissected or entire leaves, and small, yellow flowers. Sepals spreading. Sta-

mens 1-6. Pods short, terete or nearly so. Valves nerveless or 1-nerved. Style short or slender. Stigma 2-lobed or nearly entire. Seeds in 2 rows in each cell or sometimes in 1 row.

1. **Radicula obtusa** (Nutt.) Greene. BLUNT-LEAVED YELLOW-CRESS. Annual or biennial, diffuse, the branches ascending or erect. Leaves oblong or oblanceolate, pinnately-divided, or pinnatifid, the lobes obtuse, repand-toothed, or sometimes entire. Pedicels 1"-2" long. Flowers yellow, 1" broad or less. Pods narrowly oblong, or linear, 3"-5" long, ascending.

In low ground. April-August. Oklahoma County.

VI. SISYMBRIUM (Tourn.) L.

Aquatic herbs with pinnately-divided leaves, and small white flowers in terminal racemes. Pods linear to linear-oblong, slender pedicelled, tipped with a rather stout style, the valves nerveless. Seeds in two rows in each cell of the pod.

1. **Sisymbrium Nasturtium-aquaticum** L. TRUE WATER-CRESS. Glabrous, branching, floating or creeping, rooting from the nodes. Leaves of 3-9 segments, all obtuse, ovate or oval or the terminal one nearly orbicular. Flowers in racemes. Petals twice the length of the calyx. Pods 6"-16" long, 1" wide, spreading and slightly curved upward, on pedicels of about their length.

In brooks and streams. April-November, Wichita and Arbuckle Mountains and Cleveland County.

VII. LEPIDIUM. (Tourn.) L.

Erect, diffuse, glabrous or pubescent herbs. Leaves entire, toothed or pinnately divided. Flowers in terminal racemes, small, white. Petals short, sometimes wanting. Stamens 2, 4 or 6. Pod rounded or obcordate, flattened contrary to the partition.

Stem-leaves clasping by an auriculate base.

1. *L. Draba*.

Stem-leaves petioled or sessile, not clasping.

Pods slightly winged above, orbicular or oval, about 1" broad; petals present or none.

Cotyledons accumbent; petals generally present.

2. *L. virginicum*.

Cotyledons incumbent; petals minute or wanting.

3. *L. densiflorum*.

Pods oblong, winged all round, longer than wide, about 2" high.

4. *L. sativum*.

1. **Lepidium Draba** L. HOARY CRESS. Perennial, hoary-pubescent, branched at the inflorescence. Leaves oblong or lanceolate-oblong, obtuse, slightly dentate or entire, the lower petioled, the upper sessile and clasping. Flowers white, 1"-2" broad. Pods very broadly ovate, or cordate, arranged in short corymbose racemes.

Waste places. April-June, Oklahoma County.

2. **Lepidium virginicum** L. WILD PEPPER-GRASS. Basal leaves obovate or spatulate in outline, generally with a large terminal lobe and numerous, small, lateral ones, all dentate, glabrous or slightly pubescent. Stem-leaves lanceolate or oblong-linear, sharply dentate or entire, sessile, or the lower stalked. Flowers white, Stamens 2. Pods flat, short-oval or orbicular, minutely winged above.

In fields and along roadsides. May-November.

3. **Lepidium densiflorum** Schrad. WILD PEPPER-GRASS. Basal leaves pinnately-lobed or pinnatifid. Pods obovate-orbicular to ovate, slightly wing-margined above.

In dry soil. May-August. Common.

4. **Lepidium sativum** L. GARDEN PEPPER-GRASS. Annual, glabrous, usually much branched. Lower leaves 2-pinnate, or pinnate with the segments lobed, or pinnatifid, the lobes entire or incised. Stamens 6. Silicles ovate-oval, emarginate, winged all round.

In waste places. May to August. Common.

VIII. **THLASPI** (Tourn) L.

Erect, glabrous, annual or perennial herbs, with entire or dentate leaves, the basal ones forming a rosette, those of the stem or at least the upper ones, auriculate or clasping. Flowers white or purplish. Pod obcuneate, obcordate or oblong-orbicular, flattened at right angles to the narrow partition, crested or winged. Valves dehiscent. Seeds 2 or several in each cell, wingless.

1. **Thlaspi arvense** L. FIELD PENNY-CRESS. Annual, glabrous, simple or branching above. Basal leaves petioled, oblanceolate, early deciduous. Stem-leaves oblong or lanceolate, sparingly dentate, the upper clasping by an auricled base, the lower merely sessile. Flowers

white. Pods nearly orbicular when ripe, very flat, broadly winged all around, notched at the apex. Seeds rugose.

In waste places. May-August. Oklahoma County.

IX. SOPHIA Adans.

Annual or perennial herbs, pubescent with short forked hairs, with slender, branching stems, 2-pinnatifid or finely dissected leaves, and small, yellow flowers in terminal racemes, the racemes much elongated in fruit. Calyx early deciduous. Style short. Stigma simple. Pods linear or linear-oblong, slender pedicelled, the valves 1-nerved. Seeds small, in 1 or 2 rows in each cell.

Pedicels diverging nearly at right angles.

1. *S. pinnata*.

Pedicels ascending.

2. *S. incisa*.

1. ***Sophia pinnata***. (Walt) Howell. TANSY-MUSTARD. Densely canescent to glabrate. Leaves oblong in outline, 2-pinnatifid into very numerous, small, toothed or entire obtuse segments. Pedicels spreading nearly or quite at right angles to the axis. Pods horizontal or ascending, oblong or linear-oblong, compressed, glabrous or somewhat canescent.

In dry soil. May-July. Common.

2. ***Sophia incisa*** (Engelm.) Greene. WESTERN TANSY-MUSTARD. Resembles the preceding species, but is greener, nearly glabrous, or the pubescence is mixed with short, glandular hairs. Leaves pinnately divided, and the pinnæ 1-2-pinnatifid into linear-oblong entire or toothed segments. Fruiting pedicels widely ascending. Pods somewhat swollen, erect or ascending.

In dry soil. May-August. Common.

X. CHEIRINIA Link.

Annual, biennial or perennial, erect and branching herbs, pubescent or hoary, with 2-branched hairs, leaves simple, entire, toothed or lobed. Flowers yellow. Pods elongated, linear, 4-angled. Valves keeled by a prominent midvein. Stigma lobed. Seeds in 1 row in each cell.

1. ***Cheirinia asper*** (DC.) Britton. YELLOW FLOX. Rough, pubescent, or hoary, simple or branching above, lower leaves lanceolate or linear, tapering into a petiole, dentate or sometimes entire, mainly acute. Upper leaves smaller, sessile or nearly so, entire or

rarely toothed. Flowers orange-yellow. Pods linear, rough, 1½'-4' long. Seeds orbicular, wing margined.

In open places. May-July. Wichita and Arbuckle Mountains.

XI. *NORTA* Adans.

Biennial herbs, with alternate, pinnatifid or dentate leaves and medium-sized yellow flowers. Pubescence when present, of simple hairs. Seeds spreading. Pods narrowly linear, much elongated, terete. Stigma 2-lobed. Seeds in 1 or 2 rows in each cell.

1. *Norta altissima* (L) Britton. TALL SISYMBRIUM. Erect, freely branching, glabrous or nearly so. Lowest leaves runcinate-pinnatifid, petioled, the lobes lanceolate, often auriculate. Upper leaves smaller, very deeply pinnatifid, the lobes linear or lanceolate, dentate or entire, often with a narrow projection on the lower side near the base. Flowers yellowish. Pods very narrowly linear, stiff, divergent, 2'-4' long. Valves with a prominent midrib.

In waste places. May-August. Oklahoma County.

XII. *CONRINGIA* (Heist.) Adans.

Erect, glabrous, annual herbs, with elliptic or ovate entire leaves, sessile and cordate, or the lower narrowed at the base, and medium-sized, yellowish flowers in terminal racemes. Sepals and petals narrow. Style 2-lobed or entire. Pods elongated-linear, 4-angled. Seeds in 1 row in each cell. Cotyledons incumbent.

1. *Conringia orientalis* (L) Dumort. HARE'S EAR MUSTARD. Stem usually erect, simple, or somewhat branched. Leaves light green, obtuse at the apex, the upper smaller. Pedicels slender, ascending, 4"-8" long. Pods 3'-5' long, about 1' wide, 4-angled, spreading.

In waste places. May-August. Oklahoma County.

XIII. *ARABIS* L.

Annual or perennial herbs, smooth, or with forked or stellate hairs. Basal leaves spatulate, stem leaves sessile. Flowers usually white. Petals entire, usually with claws. Pods linear, flattened.

1. *Arabis virginica* (L.) Trelease. VIRGINIA ROCK-CRESS. Annual or biennial, diffuse, glabrate, the stems ascending. Leaves ob-

long, narrow, deeply pinnatifid, lower petioled, the upper nearly sessile. Flowers very small, white. Pod linear, ascending, 8"-12" long. Seeds orbicular, wing margined.

In open places. March-May.

FAMILY 29. CRASSULACEÆ. ORPINE FAMILY.

Herbs, mostly fleshy or succulent, with cymose or rarely solitary or symmetrical flowers. Stipules none. Calyx persistent, free from the ovary or ovaries, 4-5-lobed. Petals equal in number to the calyx lobes, distinct, or more or less united. Stamens of the same number or twice as many as the petals. Receptacle with a scale at the base of each carpel. Carpels of the same number as the sepals, distinct or united below. Ovules numerous. Follicles membranous, 1-celled.

I. SEDUM (Tourn.) L.

Fleshy, mostly glabrous herbs, erect or decumbent, with alternate, entire leaves and perfect flowers in terminal cymes. Calyx 4-5-lobed. Petals 4-5, distinct. Stamens 8-10. Carpels 4-5, distinct. Follicles few-seeded or many-seeded.

Petals yellow.

1. *S. Nuttallianum*.

Petals purple or white.

2. *S. pulchellum*.

1. *Sedum Nuttallianum* Raf. NUTTALL'S STONECROP. Annual, low tufted, glabrous, 2'-3' high. Leaves alternate, scattered, linear-oblong, teretish, sessile, entire. Cyme 2-5-forked. Flowers sessile or very short-pedicelled. Petals yellow, lanceolate, acute. Follicles widely divergent, tipped with the short subulate style.

In dry, open places. May. Wichita and Arbuckle Mountains.

2. *Sedum pulchellum* Michx. ROCK-MOSS. Annual, glabrous, ascending or trailing, branched at the base. Leaves densely crowded, terete or linear, sessile, obtuse at the apex, slightly auriculate at the base. Cyme 4-7-forked, its branches spreading or re-curved in flower. Flowers sessile. Petals rose-purple, pink, or white, linear-lanceolate, acute.

On rocks or rocky soil. May-July. Wichita and Arbuckle Mountains.

FAMILY 30. HYDRANGEACEÆ. HYDRANGEA FAMILY.

Shrubs, trees or vines, with simple, opposite leaves and no stipules. Flowers perfect or the exterior ones of the cluster sterile. Petals and sepals 5. Stamens twice as many as the sepals, or numerous, epigynous. Carpels 2-10, united or the apex free, the lower half adnate to the calyx. Seeds numerous.

I. PHILADELPHUS L.

Shrubs. Leaves simple, opposite, 3-5-ribbed, petioled, without stipules. Flowers solitary or in cymes, large, white. Calyx tube top-shaped, the epigynous limb 4-5-parted persistent. Petals 4-5, rounded or obovate. Stamens 20-40, shorter than the petals. Ovary 3-5 celled, many-seeded. Styles 3-5, more or less united.

1. *Philadelphus coronarius* L. MOCK ORANGE. A shrub. Leaves short-petioled, oval, elliptic or ovate-elliptic, glabrous above, pubescent beneath, acute or acuminate at the apex, rounded or narrowed at the base, denticulate with distant teeth 3-nerved.

A cultivated shrub. May-June.

FAMILY 31. ALTINGIACEÆ. ALTINGIA FAMILY.,

Forest trees producing a balsamic resin, with furrowed bark, and terete or sometimes corky-winged branchlets. Leaves alternate, glandular-serrate, palmately lobed; stipules mostly deciduous. Flowers usually monœcious, sometimes perfect, in heads. Perianth wanting. Heads of staminate flowers in terminal racemes or panicles. Pistillate flowers in solitary, long-peduncled, axillary heads. Fruit a hard, dry, multi-capsular head, sometimes armed with stout, persistent stigmas.

I. LIQUIDAMBAR L.

Large trees with resinous sap, simple, alternate-lobed, petioled leaves, and small monœcious flowers in heads, the staminate clusters racemose, the pistillate ones usually solitary. Calyx and corolla of the staminate flowers none. Stamens numerous. Filaments short. Calices of pistillate flowers grown into one. Petals none.

1. *Liquidambar styraciflua* L. SWEET GUM. A large forest tree. Bark very rough, branches usually winged with corky ridges. Leaves broader than long, subcordate at the base, deeply 3-7-lobed, glabrous above, often pubescent in the axils of the veins beneath, the lobes triangular-ovate, acute, sharply and finely serrate.

Along streams in eastern part of state. April-May.

FAMILY 32. GROSSULARIACEÆ. GOOSEBERRY FAMILY.

Erect or spreading shrubs, often with bristly or spiny stems. Leaves alternate, simple, petiolate, broadly ovate to rotund, usually palmately veined, more or less lobed and toothed; inflorescence terminal on short, lateral, sometimes leafless branches, racemose, or the raceme reduced to a single flower. Flowers regular, perfect. Calyx-tube elongated, short or obsolete. Sepals, petals, and stamens 5, alternate. Ovary 1-celled. Fruit a berry.

I. RIBES L.

Unarmed shrubs with palmately veined, mostly lobed leaves. Flowers in several-flowered racemes. Pedicels jointed beneath the ovary. Ovary not spiny, sometimes glandular. Calyx-tube tubular to campanulate, sometimes obsolete. Fruit breaking from the pedicel.

1. *Ribes odoratum* Wendl. MISSOURI CURRANT. Unarmed. Petioles rather slender, pubescent. Leaves 3-lobed or sometimes 5-lobed, broadly cuneate or truncate at the base, the lobes obtuse, few-toothed or entire. The racemes leafy-bracted, few flowered, villous. Flowers bright yellow, spicy-scented. Fruit black, glabrous.

In rich, moist soil and rocky soil. April-May. Oklahoma, Comanche and Murray counties.

FAMILY 33. PLATANACEÆ. PLANE TREE FAMILY.

Trees with simple, alternate, petioled leaves, with stipules. The bases of the petioles covering the buds. Flowers monœcious, in axillary, long peduncled, globose. Calyx and corolla very inconspicuous, each consisting of 3-8 minute scales, or wanting. Stamens as many as the sepals and opposite them. Pistils several, conversely conical, hairy at the base. Styles long. Capsule 1-seeded.

I. PLATANUS L.

Characters of the family.

1. *Platanus occidentalis* L. SYCAMORE. BUTTON-WOOD. A large tree, bark light-colored, smooth, peeling off in large, thin plates. Leaves large, round-heart-shaped, angularly lobed and toothed, densely white-woolly when young, becoming smooth with age. Stipules large, toothed.

River banks. Cleveland county to eastern part of state. May.

FAMILY 34. ROSACEÆ. ROSE FAMILY.

Herbs, shrubs or trees with alternate, stipulate leaves and perfect flowers. Calyx 5-lobed. Petals 5, rarely wanting, inserted with the stamens on the edge of a disk that lines the calyx tube. Stamens many. Carpels 1 or more, distinct or united, superior or inferior. Fruit a pome, a drupe or group of drupes, or 1-several achenes or follicles, rarely a berry or capsule.

Carpels not enclosed in the fleshy calyx-tube.

Fruit of dry achenes; receptacle very pulpy.

I. *Fragaria*.

Fruit of fleshy or nearly dry drupelets; ovary 2-ovuled.

II. *Rubus*

Carpels enclosed in the fleshy calyx-tube.

III. *Rosa*.

I. *FRAGARIA* (Tourn.) L.

Perennial scape bearing herbs propagating by runners. Leaves with 3 leaflets. Stipules united to the petiole. Flowers white. Calyx hypogynous, 5-parted, 5-bracted, persistent. Petals 5. Stamens many. Carpels many on a convex receptacle. Achenes of the ripe strawberry many, very small, more or less imbedded in the large, sweet, pulpy receptacle.

1. *Fragaria americana* (Porter) Britton. AMERICAN WOOD STRAWBERRY. Slender, light green, loosely villous-pubescent or glabrate, usually producing runners. Leaflets ovate or oval, obtuse or acute at the apex, sharply incised-dentate, the terminal commonly cuneate, the others inequilateral at the base, pubescent with silvery-appressed hairs beneath. Fruit ovoid or elongated-conic, light red or pink.

In rocky woods. May-June.

II. *RUBUS* (Tourn.) L.

Mostly prickly shrubs or trailing vines, with alternate, simple, lobed or 3-7-foliate leaves, the stipule adnate to the petiole. Flowers in terminal and axillary clusters, rarely solitary, white. Calyx hypogynous with a broad tube; its lobes 5, persistent. Petals 5. Stamens many. Carpels many, distinct on a convex receptacle. Fruit a cluster of little 1-seeded drupes on a dry or somewhat juicy receptacle.

1. *Rubus procumbens* Mugl. DEWBERRY. Trailing, shrubby, armed with scattered prickles. Branches erect or ascending, more or less pubescent, somewhat prickly. Leaves petioled, 3-7-foliate. Leaflets ovate, oval or ovate-lanceolate, acute or sometimes acutish at the apex, rounded or narrowed at the base, sharply dentate-serate. Peduncles leafy. Fruit black, delicious.

In dry soil. April-May. Common.

III. *ROSA* (Tourn.) L.

Erect or climbing shrubs. Stem commonly prickly,

leaves alternate, odd-pinnate. Stipules adnate to the petiole. Flowers corymbose or solitary, red, pink, or white. Calyx tube cup-shaped or urn-shaped, constricted at the throat, becoming fleshy in fruit, usually 5-lobed. Petals 5, spreading. Stamens many, inserted around the inside of the mouth of the calyx tube. Ovaries many, hairy, ripening into bony achenes, enclosed in a rather fleshy calyx tube.

Sepals persistent.

1. *R. Arkansana*.

Sepals deciduous.

Leaflets 7-11; calyx tube hispid.

2. *R. foliosa*.

Leaflets 5-7; calyx tube glandular-pubescent.

3. *R. virginiana*.

1. **Rosa Arkansana** Porter. A branching shrub 12'-24' tall. Stems and branches more or less densely armed with bristle-like prickles. Leaflets 7-11, the blades oval, obovate or cuneate, rounded at the apex, simply serrate, sometimes tomentose beneath. Flowers in terminal corymbs. Calyx tube glaucous. Sepals lanceolate, acuminate, glandular without, tomentose within, persistent. Corolla 1½'-2' broad. Styles distinct. Fruit sub-globose, red, glabrous.

Prairies. Spring and summer.

2. **Rosa foliosa** Nutt. A branching shrub about 3° tall. Stems and branches armed with straight or slightly curved prickles. Leaflets 7-11, the blades firm, usually acute, serrate, glabrous or nearly so. Flowers solitary or a few in corymbs. Calyx tube hispid. Sepals lanceolate, acuminate, glandular-pubescent, often lobed, deciduous. Corolla 1'-1½' broad. Styles distinct. Fruit sub-globose, red, glabrous.

On prairies. Spring and summer.

3. **Rosa virginiana** Mill. LOW or PASTURE ROSE. Bushy, 6'-6° high, armed with infra-stipular spines and prickles. Stipules entire. Leaflets 5-7, thin ovate-oval or obovate, coarsely and simply serrate, mostly acute at both ends. Flowers few or solitary, 2'-3' broad. Pedicels and calyx usually glandular. Pod glandular-hispid, about 4" high.

In dry soil. May-July. Common.

FAMILY 35. AMYGDALACEÆ. PEACH FAMILY.

Trees or shrubs with alternate, petiolate, simple, most-

ly serrate leaves. Bark, leaves and seeds bitter with prussic acid. Flowers perfect, corymbose, umbelled, racemed or solitary, regular. Calyx inferior, deciduous, free from the ovary, its tube obconic, campanulate, or tubular, 5-lobed. Petals 5, inserted on the calyx. Stamens numerous, inserted with the petals. Fruit a drupe.

I. PRUNUS (Tourn.) L.

Trees or shrubs. Leaves sharply serrate. Flowers white, produced before the leaves. Fruit fleshy, the stone flattened, acute on both edges.

Leaves abruptly acuminate; drupe red or yellow.

1. *P. americana*.

Leaves acute or obtusish; drupe red or purple.

2. *P. gracilis*.

1. **Prunus americana** Marsh. WILD YELLOW or RED PLUM. A shrub or small tree. Branches more or less thorny. Bark thick. Leaves ovate or obovate, acuminate, usually pubescent when young, sharply and often doubly serrate, with gland-tipped teeth, rounded at the base, slender-petioled. Flowers white, 8"-12" broad, appearing in lateral, sessile umbels before the leaves. Drupe globose, red or yellow, 9"-12" in greatest diameter.

In thickets. April-May.

2. **Prunus gracilis** Engelm. & Gray. LOW PLUM. A branching shrub, 12'-48' high, the foliage and young twigs densely soft-pubescent. Leaves short-petioled, ovate-lanceolate or oval, acute or acutish at both ends, sharply serrate, glabrate on the upper surface at maturity. Flowers white, 3"-4" broad, in sessile lateral umbels, appearing before the leaves. Drupe oval-globose, 4"-5" in diameter.

In sandy or dry soil. Spring.

FAMILY 36. MIMOSACEÆ. MIMOSA FAMILY.

Herbs, shrubs or trees, with alternate, mostly compound, commonly 2-3-pinnate leaves, the stipules various, and small, regular, mostly perfect flowers, in heads, spikes or racemes. Calyx 3-6-toothed, or 3-6-lobed. The corolla

of as many distinct or more or less united petals. Stamens 5-10-many, distinct or united. Ovary 1-celled. Ovules several or numerous. Fruit a more or less flattened, dehiscent or indehiscent legume.

Stamens numerous, at least more than 10. **I. Acacia.**

Stamens only as many as the petals, or twice as many.

Anthers without glandular appendages at the top.

Petals separate; pod smooth.

II. Acuan.

Petals united to about the middle; pod spiny.

III. Morongia.

Anthers, at least in the bud, topped by glandular appendages.

Herbs; pods flat and thin, twice or thrice longer than broad.

IV. Neptunia.

Shrubs or trees; pods relatively thick, many times longer than broad.

V. Prosopis.

I. ACACIA L.

Shrubs or low trees with armed or smooth stems and numerous very small leaflets. Flowers small, regular, in spikes or heads on axillary peduncles. Corolla of 4 or 5 similar petals; petals united, separate or wanting. Stamens numerous, distinct, exserted. Pods flattened or terete, 2-valved, dehiscent.

1. *Acacia angustissima* (Mill.) Kuntze. PRAIRIE ACACIA. Low, thornless shrub, varying from glabrous to hirsute-pubescent. Pinnæ of the leaves 2-15 pairs, oblong in outline, 1'-2' long. Leaflets 10-50 pairs, oblong or linear-oblong, about 2" long, less than 1" wide, slightly inequilateral, 1-veined. Heads globose, axillary, 6"-10" in diameter. Filaments yellow, 3-4 times as long as the sepals. Pod linear, acute, often narrowed at the base, mostly straight, 1'-2' long, about 3" wide, flat, its valves thin, impressed between the seeds.

Prairies. May-July. Common.

II. ACUAN Medic.

Perennial herbs or shrubs, with bi-pinnate leaves, and

greenish or whitish regular flowers in axillary, peduncled heads or spikes. Flowers perfect, or the lowest sometimes staminate. Calyx campanulate, its teeth short. Petals distinct or slightly united. Stamens 10 or 5, distinct. Pod linear, straight or curved, several-seeded, 2-valved.

1. **Acuan illionensis** (Michx.) Kuntze. ILLINOIS MIMOSA. Stems erect or ascending, glabrous, angled. Leaves short-petioled, bi-pinnate. Pinnæ 5-15 pairs, sessile. Leaflets 10-24 pairs, sometimes more, sessile, obtuse. Pods numerous, densely capitate, oblong or lanceolate, strongly curved 8"-12" long, acute, slightly appressed between the 2-5 seeds.

Prairies and river banks. May-September. Common.

III. MORONGIA Britton.

Decumbent, perennial herbs or shrubs with re-curved prickles on leaves and stems. Leaves bi-pinnate, usually sensitive. Leaflets numerous, small. Flowers pink in a globose head. Pod linear; spiny all over, at length 4-valved, several-seeded.

1. **Morongia uncinata** (Willd.) Britton. SENSITIVE-BRIER. Herbaceous, perennial, branched, decumbent. Stem, branches, petioles, and peduncles armed with hooked prickles. Stem grooved and angled. Pinnæ 4-8 pairs. Leaflets 8-15 pairs, obliquely elliptic, obtusish, and mucronate at the apex, inequilateral and rounded at the base, slightly ciliate on the margin. Head globose, very dense. Flowers pink. Pods terete, very densely spiny, about 2' long.

Dry soil. May-July. Common.

IV. NEPTUNIA Lour.

Perennial herbs or shrubby plants, with unarmed prostrate or diffused stems. Leaves with 2-pinnate blades. Leaflets small. Flowers perfect or polygamous, in head-like or cylindric spikes on solitary, axillary peduncles. Calyx 5 lobed. Corolla of 5 distinct or partially-united petals. Stamens 10, or rarely 5, exserted. Filaments distinct. Ovary stipitate. Ovules several. Pod relatively broad, flat, oblique, 2-valved.

1. **Neptunia lutea** (Leavenw.) Benth. Stems branched at the base, the branches prostrate, somewhat shaggy pubescent. Leaves

with 6-10 pinnæ. Leaflets 18-34, the blades crowded, oblong, apiculate, ciliate. Stipules ovate-lanceolate. Pods oblong, 10"-20" long, flat, abruptly pointed, contracted into a rather slender stipe.

In moist or clay soil. Spring and summer. Oklahoma and Comanche counties.

V. PROSOPIS L.

A much branched shrub or tree 20° high or less, seldom larger, with rigid, tough stems bearing large, stipular spines. Leaves 2-pinnate, the leaflets few or numerous. Flowers in axillary, pedunculate heads or spikes, greenish-white. Calyx campanulate, with 5 short teeth. Petals 5, distinct or united below. Stamens 10, distinct. Fruit an indehiscent, slightly compressed, straight or falcate legume.

1. *Prosopis glandulosa* Torr. PRAIRIE MESQUITE. A glabrous or minutely pubescent shrub, the axils usually with a pair of sharp spines. Leaves petioled, with two spreading short-stalked pinnæ, each of numerous sessile linear leaflets. Spike or spike-like racemes axillary, many-flowered. Pods linear, stipitate, 4'-8' long, 4"-6" wide, constricted between the seeds.

In dry soil. April-June. Wichita Mountains.

FAMILY 37. CÆSALPINACEÆ. SENNA FAMILY.

Trees, herbs or shrubs, with alternate, simple or compound leaves. Flowers mostly clustered and perfect. Sometimes monœcious, diœcious or polygamous, nearly regular or irregular. Calyx of 5 sepals, or 5-toothed. Petals usually 5. Stamens 10 or fewer, the filaments distinct or more or less united. Ovary 1-celled, 1-many-ovuled. Fruit a legume.

Trees or shrubs; leaves simple; corolla irregular.

I. Cercis.

Herbs; flowers perfect; leaves pinnate or bi-pinnate; corolla nearly regular.

II. Hoffmanseggia.

Trees; leaves pinnate or bi-pinnate; flowers diœcious or polygamous.

Receptacle short; stamens 3-5; pod flat, short or elongated.

III. *Gleditsia*.

Receptacle elongated; stamens 10; pod oblong, woody.

IV. *Gymnocladus*.

I. *CERCIS* L.

Trees. Leaves simple, with stipules. Flowers in axillary clusters, somewhat papilionaceous. Calyx bell-shaped, 5-toothed. Stamens 10, distinct. Ovary short-stalked; ovules several. Fruit a flattened pod.

1. *Cercis canadensis* L. RED-BUD. A tree or often shrubby. Leaves simple, petioled, cordate-orbicular, blunt-pointed, glabrous, or pubescent along the veins beneath. Flowers several together in sessile, umbellate clusters, appearing before the leaves. Corolla pink-purple. Pod short-stalked in the calyx, linear-oblong, acute at each end, glabrous, 2'-3' long, 6" wide.

In rich soil. April. Common.

II. *HOFFMANSEGGIA* Cav.

Herbs, or low shrubs, with glandular-punctate bi-pinnate leaves, small stipules, and yellow flowers in terminal or lateral racemes. Calyx deeply 5-parted, the lobes nearly equal. Petals 5, nearly equal. Stamens 10, distinct, filaments often glandular at the base. Pod flat, linear, oblong or ovate, curved or straight, 2-valved, several seeded.

1. *Hoffmanseggia falcaria* Cav. SICKLE-FRUITED *HOFFMANSEGGIA*. Herbaceous, puberulent, not black-punctate, the glands of the peduncles and petioles stalked. Stems ascending or decumbent. Leaves slender-petioled, bi-pinnate. Pinnæ 7-11. Leaflets 12-21. The blades mainly oblong, 1"-3" long. Racemes few, several-flowered. Pods flat, linear-oblong, curved or nearly straight, 1'-1½' long, about 3" wide, blunt, the fruiting pedicels recurved.

On plains and prairies. Southwest part of state. April-June.

III. *GLEDITSIA* L.

Large, thorny trees. Leaves evenly once or twice pin-

nate. Flowers small, greenish, in slender, axillary racemes, polygamous. Calyx campanulate, 3-5-cleft. Petals 3-5, inserted on the summit of the calyx tube. Stamens 6-10, distinct. Pod flat, 1-many-seeded.

Pods linear-oblong, elongate, many-seeded.

1. *G. triacanthos*.

Pods obliquely oval, short, 1-seeded. 2. *G. aquatica*.

1. ***Gleditsia triacanthos* L. HONEY LOCUST.** A large tree with rough bark, usually armed with numerous, stout, branching, or simple thorns. Leaves petioled, 1-2 pinnate. Leaflets short-stalked, oblong-lanceolate or oval, obtuse at each end, inequilateral at the base, glabrous above, often pubescent on the veins beneath, crenulate. Flowers greenish. Pod linear-oblong, 12'-18' long, 1'-1½' wide, stalked, glabrous and shining, twisted, pulpy within, sometimes eaten.

In woods. May-July. North and east part of state.

2. ***Gleditsia aquatica* Marsh. WATER or SWAMP LOCUST.** A tree, the thorns usually simple. Leaflets ovate-lanceolate or lanceolate in outline, the margins more conspicuously crenulate. Pod obliquely oval, flat, glabrous, narrowed at each end, slender-stalked, 1'-1½' long, 9"-12" wide, not pulpy within.

In swamps. May-July. Oklahoma County.

IV. GYMNOCLADUS Lam.

Trees with bi-pinnate leaves without stipules. Flowers regular, whitish, diœcious or somewhat monœcious; in racemes at the ends of the branches. Calyx tube rather long, its 5 lobes spreading. Petals oblong, all alike, inserted with the stamens on the throat of the calyx. Stamens of the fertile flowers usually not pollen-bearing. Pod hard, flat, partly filled with a sweet substance, slow in opening. Seeds several, flattish, over ½' in diameter, very hard and shining.

1. ***Gymnocladus dioica* (L.) Koch. KENTUCKY COFFEE-TREE.** A large forest tree, with rough, gray bark. Leaves large, bi-pinnate, petioled. Pinnæ 5-9, odd or evenly pinnate. Leaflets 7-15, ovate, acute or acuminate at the apex, rounded at the base, glabrous, or pubescent on the veins beneath, ciliate on the margins. Pod 5'-10' long, about 15"-21" wide.

Rich woods. May-June. Oklahoma, Woods, Custer and Cimarron counties.

FAMILY 38. KRAMERIACEÆ. KRAMERIA FAMILY.

Low, herbaceous, or woody perennials, with prostrate or widely spreading stems and silky, pubescent leaves. Leaves alternate, without stipules, entire. Flowers perfect, crimson, irregular. Calyx of 4 or 5 unequal, petaloid sepals, deciduous. Corolla of 4 or 5 petals shorter than the sepals, irregular, the posterior petal clawed, sometimes adnate, the anterior thick, sessile. Stamens 3 or 4, the filaments united at the base. Fruit an indehiscent, spiny, globose 1-seeded pod.

I. KRAMERIA Loefl.

Characters of the family.

1. **Krameria lanceolata** Torr. **LINEAR-LEAVED KRAMERIA.** Perennial herb from a thick, woody root, the stems prostrate or ascending. Leaves linear, linear-lanceolate or linear-oblong, sessile, simple, entire, about 1' long, tipped with a minute prickle. Peduncles axillary, solitary, 1-flowered. Fruit globose, pubescent, very spiny.

Dry rocky soil. April-June. Common.

FAMILY 39. FABIACEÆ. PEA FAMILY.

Herbs, shrubs or trees. Leaves alternate, usually compound, with stipules, the leaflets usually entire. Calyx of 5 sepals, more or less united, often somewhat irregular. Petals 5 or fewer, irregular, the upper petal (standard) larger than the others and inclosing them in the bud, the two lateral ones (wings) oblique, the lower two more or less coherent by their interior edges forming the keel. Stamens mostly 10, monodelpous, diadelphous, or distinct. Fruit a legume, 1-celled or 2-several-celled by cross partitions.

Key to the Genera.

Stamens distinct.

Leaves palmately trifoliate; pod inflated.

II. Baptisia.

Leaves odd-pinnate.

I. Sophora.

Stamens monodelphous or diadelphous.

Anthers all alike; stamens monodelphous; leaves odd-pinnate.

Pod 4-angled.

VIII. Indigofera.

Pod flat.

IX. Cracca.

Anthers all alike; stamens diadelphous (9 and 1); leaves usually pinnately compound, rarely palmate.

Leaves with an even number of leaflets terminated by a tendril.

XV. Vicia.

Leaves odd-pinnate, rarely palmate, without tendrils.

Foliage glandular-punctate.

Pods covered with hooked prickles.

XIV. Glycyrrhiza.

Pods not prickly.

Leaves palmately 3 or 5-foliate or pinnately 3-foliate.

VI. Psoralea.

Leaves mostly pinnately 5-many-foliate, petals 1.

VII. Amorpha.

Foliage not glandular-punctate.

Leaves 3-foliate.

Pods curved or coiled; flowers racemose.

III. Medicago.

Pods straight; flowers racemose or capitate.

Leaves pinnate; valves of the pod leathery; flowers in racemes.

IV. *Melilotus*.

Leaves digitate; pod valves thin; flowers in heads.

V. *Trifolium*.

Leaves several to many-foliate.

Shrubs or small trees; stems spiny; flowers white.

X. *Robinia*.

Herbs, at most woody only at the base.

Keel prolonged into a beak. XIII. *Oxytropis*.

Keel not prolonged into a beak.

Pod fleshy, indehiscent. XI. *Geoprumnon*.

Pod membranous, leathery or woody, dehiscent.

XII. *Astragalus*.

I. *SOPHORA* L.

Low, perennial herbs with pinnate many-foliate leaves and dense racemes of white, yellow, or violet flowers. Stamens 10, the filaments distinct or nearly so. Pods stalked in the calyx, terete, constricted between the subglobose seeds, mainly indehiscent.

1. *Sophora sericea* Nutt. SILKY SOPHORA. Herbaceous, woody at the base. Branched, silky or silvery pubescent with appressed hairs. Stipules subulate. Leaves short-petioled. Leaflets 7-25, short-stalked, obovate or elliptic, obtuse or emarginate at the apex, narrowed or cuneate at the base, 3"-6" long. Flowers white. Pod dry, coriaceous, pubescent, few-seeded.

Plains and prairies. April-June. Central part of the state.

II. *BAPTISIA* Vent.

Perennial, erect, branching herbs, with sheathing, basal scales, alternate 3-foliate or sometimes simple, perfoliate leaves and showy yellow, white or blue flowers in terminal or lateral racemes. Stipules foliaceous. Calyx campanulate, 4-5-lobed. Ovary stipulate. Pod stalked, ovoid, oblong or nearly globose, pointed, inflated.

- | | |
|--|--------------------------|
| Flowers blue; plant glabrous. | 1. <i>B. australis</i> . |
| Flowers yellow. | 2. <i>B. tinctoria</i> . |
| Flowers white or cream color.
Very pubescent. | 3. <i>B. bracteata</i> . |
| Glabrous or nearly so. | 4. <i>B. leucantha</i> . |

1. **Baptisia australis** (L.) R. Br. BLUE FALSE INDIGO. Stem glabrous, stout. Leaves short-petioled, 3-foliolate. Leaflets oblanceolate, obtuse at the apex, cuneate at the base, entire. Stipules lanceolate. Racemes terminal, erect, loosely-flowered, elongated. Bracts narrow, caducous. Flowers indigo-blue. Pods oblong, stalked in the calyx, tipped with the subulate style.

In rich soil. May-August. Common.

2. **Baptisia tinctoria** (L.) R. Br. YELLOW WILD INDIGO. Glabrous, succulent, much branched. Leaves petioled, 3-foliolate. Leaflets obovate or oblanceolate, obtuse, cuneate at the base, entire. Racemes numerous, few-flowered, terminal. Flowers bright yellow. Pod ovoid or nearly globose, 3"-5" long, tipped with the subulate style.

Dry soil. May-September. Murray County.

3. **Baptisia bracteata** Ell. LARGE-BRACTED WILD INDIGO. Low, hairy, and branching. Leaves sessile or short petioled, 3-foliolate. Leaflets oblanceolate or spatulate, narrowed or cuneate at the base, obtuse or acutish at the apex, reticulate-veined. Racemes usually few, mainly lateral, reclining, many-flowered. Flowers white or cream colored, very showy. Bracts large and persistent. Pods ovoid, mostly narrowed at the base, pubescent, tipped with a long deciduous style.

Prairies. April-May. Very common.

4. **Baptisia leucantha** T. & G. LARGE WHITE WILD INDIGO. Glabrous, succulent, branching. Leaves petioled, 3-foliolate. Leaflets obovate or oblanceolate, very obtuse, rounded or emarginate at the apex, narrowed or cuneate at the base. Racemes lateral, loosely-flowered. Flowers white. Pod ellipsoid, long-stalked in the calyx, tipped with a subulate style.

In rich soil. May-July. Hughes County.

III. MEDICAGO (Tourn.) L.

Herbs with small 3-foliolate leaves, and small, yellow or violet flowers in axillary heads or racemes. Leaflets commonly dentate, pinnately-veined, the veins terminating in the teeth. Calyx teeth short, nearly equal. Standard obovate or oblong, wings oblong, keel obtuse. Sta-

ments diadelphous. Ovary sessile or nearly so. Style subulate. Pod curved or spirally twisted, reticulated or spiny.

Perennial; flowers violet, conspicuous. 1. *M. sativa*.

Annual; flowers bright yellow, small. 2. *M. lupulina*.

1. **Medicago sativa** L. ALFALFA. Perennial, much branched. Leaves petioled. Leaflets oblanceolate or obovate, 2"-12" long, dentate, especially toward the apex, obtuse, cuneate at the base. Stipules entire. Flowers violet or blue in a dense short raceme. Pod pubescent, twisted into 2 or 3 spires.

In fields and waste places. Spring and summer. Cultivated.

2. **Medicago lupulina** L. BLACK MEDIC. Annual, pubescent, branched at the base, the branches decumbent and spreading. Leaves petioled. Leaflets obovate, denticulate or crenulate, narrowed or rounded at the base. Stipules ovate or lanceolate, dentate. Head oblong or cylindric, dense. Flowers bright yellow. Pods nearly glabrous, curved into a partial spiral, strongly veined.

In fields and waste places. March-December. Common.

IV. MELILOTUS (Tourn.) Mill.

Annual or biennial herbs, with 3-foliolate, petioled leaves, dentate leaflets, and small, white or yellow flowers in slender racemes. Calyx teeth short. Standard obovate or oblong, wings oblong, keel obtuse. Stamens diadelphous. Ovary sessile or stipitate. Pod ovoid or globose, straight.

Flowers white; standard a little longer than the wings.

1. *M. alba*.

Flowers yellow; standard about equaling the wings.

2. *M. officinalis*.

1. **Melilotus alba** Desb. WHITE SWEET-CLOVER. Glabrous, branching, or young leaves and twigs finely pubescent. Leaves petioled. Leaflets, oblong, serrate, narrowed at the base, truncate at the apex, stipules subulate. Racemes numerous. Flowers white. Pods ovoid, slightly reticulated and glabrous.

In waste places. Common. May-November.

2. **Melilotus officinalis** (L.) Lam. YELLOW SWEET-CLOVER. Resembling the preceding species, but flowers yellow. Leaflets rounded at the apex, oblong or oval. Pod with irregularly reticulated veins, often slightly pubescent with appressed hairs.

In fields and waste places. March-December. Common.

V. TRIFOLIUM (Tourn.) L.

Annual, biennial, or perennial herbs. Leaves petioled, of 3 toothed or serrate leaflets. Stipules united to the petioles. Flowers white, yellow, or red, in heads. Calyx 5-cleft, the teeth nearly equal, awl-shaped. Keel shorter than the wings. Stamens diadelphous. Pod smooth, 1-6-seeded, scarcely opening.

Flowers sessile, or very nearly so; heads dense, ovoid, oval or globose. 1. *T. pratense*.

Flowers pedicelled; heads umbel-like, globose.

Ascending or procumbent; flowers pink, pinkish, or purple. 2. *T. hybridum*.

Creeping; flowers white or pinkish. 3. *T. repens*.

1. *Trifolium pratense* L. RED CLOVER. Perennial, more or less pubescent, branching. Leaves long-petioled. Stipules ovate, strongly veined, subulate-tipped. Leaflets short-stalked, oval, oblong, or obovate, finely toothed, often with a dark, triangular spot near the center. Flowers red. Calyx teeth bristle-shaped hairy. Pod 1-3-seeded.

Moist waste places. April-November.

2. *Trifolium hybridum* L. ALSIKE CLOVER. Perennial, erect or ascending. Leaflets ovate, the margins fringed with hairs, serrulate with sharp, pointed teeth, rounded at the apex. Stipules prolonged into bristle-points. Flowers rose color and white.

In waste places. May-October.

3. *Trifolium repens* L. WHITE CLOVER. Resembling preceding species but the branches creeping, often rooting at the nodes. Leaflets obovate or obcordate, denticulate. Head globose. Flowers white, finally reflexed. Stipules ovate-lanceolate.

Waste places and lawns. May-December. Common.

IV. PSORALEA (B. Juss.) L.

Perennial herbs. Whole plant glandular dotted. Leaves mostly 3-5 foliolate. Flowers in axillary or terminal spikes or racemes. Calyx 5-cleft, the lobes nearly equal. Standard ovate or orbicular, keel incurved, obtuse. Stamens monodelphous or diadelphous, 5 of the anthers often undeveloped. Ovary nearly sessile. Pod included in the calyx, often wrinkled, indehiscent, 1-seeded.

Plants leafy-stemmed.

Flowers small, 2"-4" long.

Pods sub-globose.

1. *P. lanceolata*.

Pods ovoid, or ovate.

Pods with a short, mostly abrupt beak.

Flowers few, scattered in slender elongated racemes.

2. *P. tenuiflora*.

Flowers numerous, clustered, or crowded in racemes.

3. *P. floribunda*.

Pods with a slender, sharp, or elongated beak.

Leaflets linear; flowers in loose, elongated racemes.

4. *P. linearifolia*.

Leaflets linear-lanceolate, oblong, oblanceolate or ovate; flowers spiked.

Leaflets linear-lanceolate, calyx inflated in fruit.

5. *P. digitata*.

Leaflets oblong; calyx not inflated in fruit.

6. *P. argophylla*.

Flowers large, 6"-8" long, densely spicate.

7. *P. cuspidata*.

Plants acaulescent, or nearly so, low, spreading; roots tuberous.

8. *P. esculenta*.

1. **Psoralea lanceolata** Pursh. LANCE-LEAVED PSORALEA. Glabrous or nearly so, yellowish-green, densely punctate. Leaflets 3, linear to oblanceolate. Flowers small, in very short spikes. Calyx about 1" long, with short broad teeth.

Dry soil. May-July. Northwest part of state.

2. **Psoralea tenuiflora** Pursh. FEW-FLOWERED PSORALEA. Upright, slender, bushy and branching, 2°-4° high, covered when young with a fine, grayish down. Leaves palmately compound, with 3-5 linear to obovate-oblong leaflets, covered with glandular dots. Flowers purplish, 2"-3" long, loosely racemed. Pods rough with glands.

Prairies. May-October. Common.

3. **Psoralea floribunda** Nutt. MANY-FLOWERED PSORALEA. Profusely branching, canescent, not glandular. Leaves 3-5 sometimes 7-foliate. Leaflets 5"-18" long, 1½"-4" wide, oblong, glandular on both surfaces, rugose, glabrous, or with a few, scattered hairs above, canescent with closely appressed white hairs beneath. Spikes or

racemes usually many-flowered. Pod ovoid, glabrous, light brown, covered with darker glands.

Prairies. May-October. Common.

4. *Psoralea linearifolia* T. & G. NARROW-LEAVED PSORALEA. Stems not always glandular, glabrous, or sparingly pubescent with appressed hairs. Leaves sessile or short petioled, 1-3-foliolate, 5"-15" long, 1"-2" wide, linear, rugose, glandular, glabrous, or with a few appressed hairs. Flowers blue, loosely scattered. Pod 4" long, narrowly ovoid or oblong, glandular.

Prairies. May-August. Western part of state.

5. *Psoralea digitata* Nutt. DIGITATE PSORALEA. Canescent with appressed hairs, widely branching. Leaflets 5, or of the upper leaves 3, digitate. Flowers blue, spiked. Pod ovoid, flattish, pubescent.

Prairies and hills. May-July. Kingfisher and Harmon counties.

6. *Psoralea argophylla* Pursh. SILVER-LEAF PSORALEA. Densely silvery-pubescent, with white appressed hairs throughout, widely branched. Stem often zigzag. Leaflets 3-5, digitate, oval, oblong or obovate, mucronate. Flowers blue, spiked. Calyx-tube about 1" long, the lower tooth about twice as long as the upper teeth. Pod ovate.

Prairies. May-August. Kingfisher County.

7. *Psoralea cuspidata* Pursh. LARGE-BRACTED PSORALEA. Branched, finely appressed-pubescent, from a long, deep, tuberous-thickened root. Leaflets 5, digitate, entire, oblanceolate or oval. Spikes oblong, dense. Bracts lanceolate, long-cuspidate, equaling or exceeding the bluish corolla. Pod oval, enclosed in the calyx.

Prairies. May-June. Common.

8. *Psoralea esculenta* Pursh. PRAIRIE APPLE or TURNIP. Rather stout from a large, turnip-shaped, starchy, edible root. Stem densely villous-pubescent with whitish hairs. Leaflets 5, digitate, oval or obovate, entire. Spikes oblong, dense. Bracts lanceolate, nearly equaling the bluish corolla. Pod oblong, glabrous, slightly wrinkled, enclosed in the calyx-tube.

Prairies. May-June. Oklahoma and Comanche counties.

VII. AMORPHA L.

Shrubs with glandular-punctate, odd-pinnate, many-foliolate leaves. Flowers in terminal, more or less elongated spikes. Calyx teeth 5, about equal. Petals 1. Stamens monodelphous. Pods small, 1-seeded.

1. *Amorpha fruticosa* L. FALSE INDIGO or RIVER-LOCUST. A shrub with pubescent or glabrous foliage. Leaflets 11-21, distant, oval or elliptic, entire. Spike-like racemes dense, clustered or soli-

tary. Standard violet-purple, emarginate. Stamens exserted. Pod glabrous, glandular.

Along streams. May-July. Common.

VIII. INDIGOFERA L.

Herbs, or rarely shrubs, often canescent, with hairs attached by the middle, with odd-pinnate leaves, small stipules, and pink or purple spicate or racemose flowers. Standard, ovate, or orbicular, sessile or clawed. Wings oblong. Keel erect, somewhat gibbous, or spurred. Stamens mainly monodelphous, anthers all alike. Pod linear, 4-angled, septate between the seeds.

1. *Indigofera leptosepala* Nutt. WESTERN INDIGO-PLANT. Perennial, decumbent, pubescent, branching. Leaves short-petioled. Leaflets 5-9, oblanceolate or oblong-linear. Spikes, peduncles, loosely few-flowered. Flowers pink or purplish. Pods linear, acute, obtusely 4-angled, reflexed at maturity.

Prairies. May-November. Frequent.

IX. CRACCA L.

Herbs, with odd-pinnate, not punctate, leaves, and purple, red, or white flowers in terminal or lateral racemes or short clusters. Leaflets entire. Calyx-teeth usually nearly equal. Petals clawed. Standard orbicular or broadly ovate; wings obliquely ovate or oblong; keel curved. Stamens monodelphous; anthers all alike. Pod linear, flat, 2-valved, several seeded.

Raceme terminal, dense, nearly sessile, many-flowered.

1. *C. virginiana*.

Peduncles terminal and lateral, elongated, few-flowered.

2. *C. hispidula*.

1. *Cracca virginiana* L. GOAT'S RUE. Villous or silky pubescent with whitish hairs. Roots long, fibrous, tough. Leaves short-petioled. Leaflets 7-25, oblong or linear-oblong. Flowers yellowish-purple, crowded into a terminal, often compound, nearly sessile raceme. Pod linear, densely pubescent, 1'-2' long.

Dry, sandy and rocky soil. May-July. Frequent.

2. *Cracca hispidula* (Michx.) Kuntze. FEW-FLOWERED GOAT'S RUE. Somewhat pubescent, procumbent, much branched, slender,

1°-2° long. Leaves petioled, leaflets 5-19, short-stalked, oval, oblong, oblanceolate or obovate, narrowed, rounded or cuneate at the base, obtuse, emarginate or acute at the apex. Peduncles lateral or terminal, slender, 2'-4' long. Flowers red-purple, few, terminal, about 6" long. Pod linear, 1'-1½' long, 2" wide, finely pubescent.

Dry soil. May-August.

X. ROBINIA L.

Spiny trees or shrubs with odd-pinnate leaves, rather large, white or pink flowers in crowded, axillary, short-peduncled racemes. Stamens diadelphous. Pod flat, linear, not septate between the seeds, tardily 2-valved.

1. **Robinia Pseudo-Acacia** L. BLACK LOCUST. A tree of medium size, with rough bark. Leaflets 9-15, ovate or oblong, obtuse and slightly mucronate at the apex. Stipules forming persistent spines. Racemes loose, pendulous, 3'-5' long. Flowers white, fragrant. Pod smooth, 4-8-seeded. Introduced and quite common.

Rich soil and in cultivation. Common.

XI. GEOPRUMNON. Rydb.

Perennial herbs, with tufted, decumbent or ascending stems, odd-pinnate leaves with entire leaflets, and rather large, showy, flowers in peduncled, axillary racemes. Standard rather narrow, erect, notched, longer than the wings. Keel shorter than the wings. Stamens diadelphous, the anthers all alike. Pod globose, fleshy, becoming spongy, indehiscent, completely 2-celled.

Pod ovoid, about 6" long, not wrinkled.

1. *G. plattense*.

Pod oblong, curved, 1' long or more.

2. *G. tennesseense*.

1. **Geoprurnon plattense** (Nutt.) Rydb. PLATTE MILK VETCH. Villous-pubescent with spreading hairs, prostrate or ascending, 6'-12' high. Leaflets 13-29, oblong to ovate, obtuse at the apex, narrowed at the base, 4"-9" long, about 2" wide. Flowers yellowish-white or tipped with purple, about 9" long in short heads. Pod ovoid, pointed, smooth, loosely pubescent, nearly straight.

Prairies. May. Common.

2. **Geoprurnon tennesseense** (A. Gray) Rydb. TENNESSEE MILK VETCH. Stem erect or ascending from a deep root. Plant villous

with long whitish hairs. Leaflets 15-31, oblong, or linear oblong. Stipules lanceolate or oval. Racemes short, several-many-flowered. Pod oblong, conic, fleshy, strongly wrinkled, its summit strongly curved.

On hillsides. March-May. Oklahoma County.

XII. ASTRAGALUS (Tourn.) L.

Herbs, with odd-pinnate leaves, and purple, violet, white, or yellow flowers in spikes or racemes, or, rarely, umbellate or solitary. Stipules present. Petals clawed. Standard erect, ovate or oblong. Wings oblong. Keel obtuse, about equaling the wings. Stamens diadelphous. Anthers all alike. Pod sessile, dehiscent, 1-2-celled.

Plants scapose, or very short-stemmed; pod curved, 8-shaped in cross-section. 1. *A. Shortianus*.

Plant leafy-stemmed; pods 1-celled, small, transversely wrinkled. 2. *A. gracilis*.

1. **Astragalus Shortianus** Nutt. SHORT'S MILK VETCH. Silvery canescent, somewhat branched from the base. Stipules ovate. Leaflets 9-15, elliptic or obovate. Flowers blue or violet. Peduncles shorter than the leaves. Pod 1-celled, sessile, coriaceous, 8-shaped in section, lanceolate-ovoid, puberulent, strongly curved and beaked.

Plains and hills. May-July. Oklahoma and Cleveland counties.

2. **Astragalus gracilis** Nutt. SLENDER MILK VETCH. Finely pubescent, simple or nearly so. Stipules ovate. Leaflets 7-21, narrowly linear to linear-oblong, scarcely 1" wide. Flowers purple in spike-like racemes. Pod 1-celled, pendent, ellipsoid, finely appressed-pubescent with white hairs.

Prairies. May-June. Southwest part of State.

XIII. OXYTROPIS DC.

Herbs, mostly acaulescent, with odd-pinnate leaves, and racemose or spicate flowers. Petals clawed. Standard erect, ovate or oblong. Wings oblong. Keel erect, shorter than or equaling the wings, its apex mucronate, acuminate or appendaged. Stamens diadelphous. Anthers all alike. Pod 2-valved, 1-celled, or more or less 2-celled by the intrusion of the ventral suture.

1. **Oxytropis Lamberti** Pursh. STEMLESS LOCO or CRAZY-WEED. Silky pubescent, with appressed or silky hairs, acaulescent or nearly

so, tufted. Leaves 4'-9' long, leaflets 9-19, linear or oblong. Peduncles longer than the leaves. Flowers purple, yellow, or purplish, in dense heads or spikes. Pod incompletely 2-celled, sessile, ovoid-cylindric, densely pubescent.

Prairies. April-August. Common.

XIV. GLYCYRRHIZA (Tourn.) L.

Perennial herbs, with glandular-punctate foliage, odd-pinnate leaves and short, axillary racemes of greenish-white flowers. Standard narrowly ovate or oblong, short-clawed. Wings oblong, acutish. Keel acute or obtuse, shorter than the wings. Stamens mainly diadelphous. Anthers alternately smaller and longer. Pod covered with prickles or glands, nearly indehiscent.

1. **Glycyrrhiza lepidota** Pursh. AMERICAN LICORICE. Foliage with minute scales or glands. Stipules lanceolate or ovate-lanceolate, deciduous. Leaves petioled. Leaflets 11-19, lanceolate or oblong, entire. Peduncles much shorter than the leaves. Spikes dense, many-flowered. Flowers yellowish-white. Calyx-teeth slender, longer than the tube. Pod about 6" long, oblong, densely covered with hooked prickles.

Waste places. May-August. Common.

XV. VICIA (Tourn.) L.

Slender herbs climbing by tendrils borne at the ends of the pinnate leaves. Half sagittate or entire stipules. Flowers in axillary racemes or few-flowered clusters. Calyx 5-toothed, the upper divisions somewhat shorter. Wings of the corolla adnate to the keel. Stamens diadelphous (9 and 1). Style very slender with a tuft or ring of hairs at its summit. Pods flat, 2-several-seeded, 2-valved.

Flowers 7"-10" long.

Leaflets thin, not strongly veined, usually oval, often linear-oblong.

1. *V. americana*.

Leaflets thick, strongly veined, linear or linear-oblong.

2. *V. sparsifolia*.

Flowers 2"-5" long, peduncles 3-4-flowered; flowers bright blue.

3. *V. Leavenworthii*.

1. *Vicia americana* Muhl. AMERICAN VETCH. Perennial, glabrous, trailing or climbing. Leaflets 8-14, elliptic or ovate-oblong, obtuse, peduncle shorter than the leaves. Racemes loose, 2-9-flowered. Flowers bluish-purple, 8"-9" long, spreading. Pod glabrous, 1'-1¼' long.

In moist ground. May-August. Oklahoma County.

2. *Vicia sparsifolia* Nutt. NARROW LEAVED AMERICAN VETCH. Perennial, glabrous, stems weak, often zigzag. Leaflets 4-7 pairs, narrowly linear to linear-oblong, peduncles shorter than the leaves. Racemes loose, 2-6-flowered. Flowers purple or purplish, about 9" long. Pod glabrous.

In dry soil. May-August.

3. *Vicia Leavenworthii* T. & G. LEAVENWORTH'S VETCH. Perennial, reclining or climbing. Leaflets 10-14, oblong to oblanceolate. Peduncles shorter or longer than the leaves. Pedicels curved. Flowers bluish. Pods oblong, oblique at each end.

In dry soil. May-June. Kingfisher County.

FAMILY 40. GERANIACEÆ. GERANIUM FAMILY.

Herbs with perfect, regular, hypogynous flowers. Sepals 5, mostly persistent. Petals of the same number. Stamens of the same number to 2-3 times as many, distinct, anthers 2-celled, versatile. Ovary 1-5-lobed and 5-celled. Ovules 1 or 2 in each cavity. Fruit a capsule.

I. GERANIUM (Tourn). L.

Herbs with perfect, regular, hypogynous flowers. Sepals 5, 5-lobed, cleft or parted. Flowers regular. Sepals 5. Petals 5, hypogynous. Stamens 10, generally 5 longer and 5 shorter. Ovary 5-lobed, 5-celled. Ovules 2 in each cavity. Capsule dehiscent, the cavities 1-seeded.

Beak short-pointed; inflorescence compact.

1. *G. carolinianum*.

Beak long-pointed; inflorescence loose. 2. *G. Bicknellii*.

1. *Geranium carolinianum* L. CAROLINA CRANE'S-BILL. Annual, generally branched from the base and above, pubescent with spreading, often glandular, gray hairs. Leaves petioled, reniform-orbicular in outline, deeply cleft into 5-9 oblong or obovate, cuneate-toothed or lobed segments. Peduncles 2-flowered. Flowers in compact clus-

ters, pale pink or whitish. Sepals ovate, ciliate, awn-pointed, ovary-lobes hispid-pubescent. Beak nearly 1' long, short-pointed.

In waste places. April-June. Common.

2. *Geranium Bicknellii* Britton. BICKNELL'S CRANE'S-BILL. Similar to preceding species, but taller. Leaves slender-petioled, somewhat angulate in outline, the segments oblong or linear-oblong, mostly narrower. Peduncles 2-flowered. Flowers in loose clusters. Sepals lanceolate, awn-pointed. Ovary lobes pubescent. Beak about 1' long, long-pointed, its tip 2"-3" long..

Waste places. May-September. Oklahoma County.

FAMILY 41. OXALIDACEÆ. WOOD-SORRELL FAMILY.

Low perennials from small, bulblike, or elongated rootstocks, stemless or with stems. Leaves alternate or all basal, palmately 3-several-foliolate, the leaflets mostly obcordate. Flowers in scapose cymes or in few-flowered axillary clusters. Calyx of 5 sepals. Petals rose or yellow. Stamens 10, the filaments united at the base. Pistil of 5 united carpels. Fruit a capsule, the seeds transversely wrinkled.

Plants acaulescent, with bulb-like or scaly rootstocks; corolla white, pink, or rose-purple. **I. *Ionoxalis*.**

Plants caulescent; corolla yellow. **II. *Xanthoxalis*.**

I. *IONOXALIS* Small.

Perennial, acaulescent herbs, with leaves and scapes rising from scaly bulbs. Petioles elongated. Leaf blades palmately 3-several-foliolate, the leaflets narrowly to broadly obcordate, with cuneate bases. Flowers in bracted, cymose clusters at the end of long, slender, weak, scapelike peduncles. Sepals 5, with tubercles at the apex. Stamens 10. Filaments usually pubescent, united at the base. Capsule elongated, 5-celled.

1. *Ionxalis violacea* (L.) Small. VIOLET WOOD-SORREL. Perennial from a brownish bulb with ciliate scales, acaulescent, 4'-9' high. Leaflets obcordate, the midrib sometimes sparingly hairy. Flowers

8"-10" long. Petals rose-purple or white, 3 times as long as the sepals. Capsule ovoid, 2" in diameter.

In woods and open places. May-June. Common.

II. XANTHOXALIS Small.

Low herbs, with horizontal rootstocks sometimes bearing fusiform tubers. Stem erect or decumbent. Leaves alternate, palmately 3-foliolate. Leaflets broadly obcordate, usually inequilateral. Corolla yellow, sometimes with a darker eye. Stamens 10. Filaments glabrous, or the longer ciliate. Capsule elongated, 5-celled.

Stem appressed-pubescent; not creeping. 1. *X. stricta*.

Stem loosely pubescent; a plant with creeping stems.

2. *X. corniculata*.

1. **Xanthoxalis stricta** (L.) Small. UPRIGHT YELLOW WOOD-SORREL. Plants low, and erect, pale green. Stem branched at the base. Leaflets closing when touched. Flowers yellow, fragrant, in umbel-like cymes. Pedicels at length reflexed. Petals 4"-5" long, commonly red at the base. Capsule 8"-15" long.

In woods and fields. April-August. Common.

2. **Xanthoxalis corniculata** (L.) Small. YELLOW or PROCUMBENT WOOD-SORREL. Stem branched at the base, the branches creeping, somewhat pubescent. Leaflets obcordate, wider than long. Petioles slender, dilated at the base. Flowers yellow, 2"-6" long, appressed pubescent.

Waste places. February-November. Oklahoma County.

FAMILY 42. LINACEÆ. FLAX FAMILY.

Annual or perennial herbs, with alternate or opposite leaves, sessile leaves and perfect flowers. Stipules small or none. Sepals 5. Petals of the same number as the sepals and alternate with them. Stamens of the same number, alternate with the petals. Filaments monodelphous at the base. Ovary 2-5-celled, or by false septa 4-10-celled.

Flowers blue; stigmas introrse, more or less elongated, sepals glandless.

I. **Linum**.

Flowers yellow; stigmas capitate; sepals, at least the inner ones, glandular on the margins.

II. Cathartolinum.

I. LINUM (Tourn.) L.

Annual or perennial herbs, with alternate or opposite leaves. Leaves sessile. Inflorescence axillary or terminal. Stipules none. Sepals 5, persistent. Petals 5, blue, red or rarely white, falling early. Stamens 5, monodelphous. Ovary 5-celled. Capsule 5-10-valved.

Annual; capsule about as long as the calyx; introduced.

1. *L. usitatissimum*.

Perennial; capsule much exceeding the calyx; naturalized.

2. *L. Lewisii*.

1. *Linum usitatissimum* L. FLAX. LINT-BELLS. Annual, erect, 12'-20' high; glabrous. Leaves alternate, 3-nerved, lanceolate, 6"-18" long. Flowers in terminal, leafy, cymose panicles. Flowers blue, 6"-8" broad, twice the length of the sepals. Capsule ovoid-conic, 3"-4" long, indehiscent.

Waste places and ballast. April-July.

2. *Linum Lewisii* Pursh. LEWIS WILD FLAX. Perennial by a woody root, 12'-24' high, glabrous. Leaves crowded, oblong, or linear, 3"-20" long, 3-5-nerved. Flowers blue, 12"-18" broad. Capsule broadly ovoid, 2-3 times as long as the calyx, dehiscent.

Prairies. May-July.

II. CATHARTOLINUM Reichb

Annual or short-lived perennial herbs, with slender, angled stems and small, sessile leaves. Flowers yellow, with persistent sepals, and caducous petals. Sepals acute, with fine gland-tipped teeth along the margins of at least some of them. Capsule ovoid to spherical, the partitions mostly complete.

Outer sepals slightly exceeding the capsule; false partitions of the capsule slightly thickened. 1. *C. rigidum*.

Outer sepals greatly exceeding the capsule; false septa of the capsule thickened for about one-half their width.

2. *C. Berlandieri*.

1. **Cathartolinum rigidum** (Pursh.) Small. LARGE-FLOWERED YELLOW FLAX. Glabrous or puberulent, 6'-15' high. Leaves linear or linear-lanceolate 4"-12" long. Glandular-serrulate or ciliate. Flowers yellow, 9"-15" broad. Capsule ovoid, 5-valved, shorter than the sepals, 2"-2½" long.

Prairies. May-July.

2. **Cathartolinum Berlandieri** (Hook.) Small. BERLANDIER'S YELLOW FLAX. Bright green, glaucescent, perennial, stem 3'-16' high. Leaves linear or linear-lanceolate, 7"-20" long. Flowers bright yellow, 16"-24" broad. Sepals evenly glandular-toothed. Petals obovate. Capsule ovoid, 2"-2¼" long.

In dry soil. April-June.

FAMILY 43. ZYGOPHYLLACEÆ. CALTROP FAMILY.

Trailing herbs or spreading shrubs, with compound leaves, 2-several-foliolate, abruptly-pinnate leaves. Leaflets small, entire. Flowers perfect, yellow or orange, rather small, regular. Sepals 5. Petals 5. Stamens twice as many, in 2 whorls. Pistil of 5 united carpels. Fruit a capsule of various forms, 3-12-celled, separating at maturity into nutlets containing the seed.

Fruit with several strong sharp spines. I. **Tribulus**.

Fruit merely tuberculate, not spiny. II. **Kallstroemia**.

I. **TRIBULUS** (Torun.) L.

Prostrate herbs with evenly-pinnate stipulate leaves and axillary flowers. Sepals 5, deciduous. Petals 5, deciduous. Stamens 10, hypogynous, the alternate ones somewhat longer. Ovary sessile, 5-lobed, 5-celled, hairy. Fruit 5-angled, spiny, splitting into five 3-5-seeded segments.

1. **Tribulus terrestris** L. GROUND BURNUT. Annual pubescent, the stem prostrate, sometimes 12' long or more. Leaflets 4-8 pairs, oblong, inequilateral, opposite, 3"-8" long. Flowers solitary, about 6" broad. Peduncles shorter than the leaves. Petals oblong, about as long as the sepals. Segments of the fruit each with two stout spines and two or more smaller ones.

Waste places. May-September. Common. Becoming a very bad weed in Oklahoma.

II. KALLSTROEMIA Scop

Annual, branching, pubescent herbs, the branches often prostrate, with opposite evenly-pinnate leaves, and solitary, axillary, yellow flowers. Petals and sepals 5. Stamens 10. Fruit 10-12-lobed, not spiny, often tubercled, splitting into 10-12 1-seeded segments.

1. *Kallstroemia intermedia* Rydb. GREATER CALTROP. Annual, branches slender, hirsute and pilose, prostrate, 5'-18' long. Leaflets 3-5 pairs, oval or oblong, inequilateral, 4"-10" long. Flowers 1' broad or less, yellow. Fruit ovoid-conic, strigose-canescens, about 3" in diameter, shorter than the persistent style, segments tubercled. In dry soil. April-September. Grady County.

FAMILY 44. RUTACEÆ. RUE FAMILY.

Trees or shrubs, with heavy-scented and glandular-punctate foliage, alternate or opposite, mainly compound leaves without stipules, and polygamo-diœcious, generally cymose flowers. Sepals 3-5, or none. Petals 3-5, hypogynous or perigynous. Stamens of the same number, or twice as many, distinct. Pistils 1-5, distinct, or 1 and compound of 2-5 carpels. Fruit a capsule or a samara.

Pistils 1-5, distinct; fruit fleshy, capsular.

I. *Zanthoxylum*.

Pistil 1, 2-celled; fruit a samara.

II. *Ptelea*.

I. ZANTHOXYLUM L.

Trees or shrubs, with bark, twigs and petioles usually prickly. Leaves odd-pinnate, marked with translucent dots. Flowers in axillary or terminal cymes or umbels, monœcious or diœcious. Sepals and petals 3-5 or none. Stamens 3-5, hypogynous. Pistils 2-5, distinct. Carpels 2-valved, 1-2-seeded. Seeds smooth and shining.

1. **Xanthoxylum americanum** Milo. PRICKLY ASH. TOOTHACHE-TREE. A prickly, aromatic shrub. Leaves alternate, odd-pinnate. Leaflets 3-11, ovate, opposite, nearly sessile, $1\frac{1}{2}$ '-2' long. Flowers greenish, in the sessile, axillary cymes, borne on the wood of the previous season and appearing before the leaves. Calyx none. Petals 4 or 5. Pistils 2-5. Follicles black, about 2" long.

In woods and thickets. April-May.

II. PTELEA L.

Shrubs or small trees, without prickles. Leaves 3-5-foliolate, with entire or serrulate leaflets. Flowers greenish-white, polygamous, corymbose-paniculate. Calyx 4-5-parted, imbricated. Petals 4-5, imbricated. Stamens 4-5, alternate with the petals. Ovary flattened, 2-celled. Fruit a nearly orbicular samara, 2-winged.

1. **Ptelea trifoliata** L. THREE-LEAVED HOP-TREE. A shrub. Leaves long petioled, 3-foliolate. Leaflets ovate or oval, 2'-5' long, sessile, crenulate. Flowers in terminal, compound cymes. Odor disagreeable. Samara 8"-9" in diameter, the wing membranous and reticulated, emarginate.

In woods and rocky soil. May-June. Kingfisher-Comanche counties.

FAMILY 45. POLYGALACEÆ. MILKWORT FAMILY.

Herbs or shrubs with simple or entire leaves and no stipules. Flowers mostly small, papilionaceous in appearance. Sepals 2 to 5. Petals 3. Stamens monodelphous or diadelphous, with 1-celled anthers opening with a terminal pore. Pods flat, 1 or 2-celled.

I. POLYGALA (Tourn.) L.

Low herbs or shrubs with solitary or racemose flowers and small simple leaves. Sepals 5, the 2 lateral ones large and petaloid. Petals 3, united to each other and to the stamen tube, the middle one often crested and appendaged. Stamens 6 or 8. Pod 2-celled, flattened contrary to the partition, sometimes winged.

1. **Polygala alba** Nutt. WHITE MILKWORT. Perennial, glabrous, erect, branched from the base. Leaves alternate, linear, 3"-12" long, entire. Spike terminal, dense, 1'-2' long. Flowers 1"-1½" long, white. Wings oblong-ovate. Seeds silky, about twice the length of the caruncle lobes.

Prairies. May-July.

FAMILY 46. EUPHORBIACEÆ. SPURGE FAMILY.

Monœcious or diœcious herbs or shrubs, with acrid or milky sap. Leaves simple, sessile or petiolate, alternate or opposite. Stipules present or wanting. Flowers apetalous or petaliferous, sometimes much reduced and subtended by an involucre which resembles a calyx, the number of parts of the perianth varying in the staminate and pistillate flowers in the same species. Stamens few or numerous, in one series or many. Filaments separate or united. Ovary usually 3-celled. Ovules 1 or 2 in each cavity. Styles as many as the cavities in the ovary. Fruit a mostly 3-lobed capsule, separating into three 2-valved carpels from a persistent axis at maturity.

Flowers not in an involucre, with a true calyx.

Ovules 2 in each cavity of the ovary.

I. **Phyllanthus.**

Ovule 1 in each cavity of the ovary.

Flowers spicate, racemose or axillary; calyx not corolla-like.

Corolla present in either the staminate or pistillate flowers, or in both.

II. **Croton.**

Corolla none; pubescence not stellate.

Pistillate flowers with foliaceous or scale-like bracts; stamens 8 or more.

III. **Tragia.**

Pistillate flower with glandular, saucer-

shaped bracts; stamens 2 or 3.

IV. *Stillingia*.

Flowers in cymes; calyx corolla-like, salver-form.

V. *Cnidoscolus*.

Flowers in an involucre, the calyx represented by a minute scale at the base of the filament-like pedicel. Glands of the involucre with petal-like appendages, these sometimes much reduced.

Leaves all opposite.

VI. *Chamæsyce*.

Leaves alternate or scattered at least below the inflorescence.

Annual or biennial; stipules narrow; bracts petal-like.

VII. *Dichrophyllum*.

Perennial; stipules none; bracts not petal-like.

VIII. *Tithymalopsis*.

Glands of the involucre without petal-like appendages, entirely naked, sometimes with crescent-like horns.

Stem topped by an umbel; stipules none; involucre in open cymes, each with four glands and entire or toothed lobes.

IX. *Tithymalus*.

Stem not topped by an umbel; stipules gland-like; involucre in cluster-like cymes, each with a single gland or rarely 4 glands and fimbriate lobes.

X. *Poinsettia*.

I. *PHYLLANTHUS* L.

Annual, biennial or perennial herbs. Stems wiry. Leaves alternate, entire. Flowers monœcious, apetalous, a staminate and pistillate one together in the axils. Stamens usually 3, the filaments more or less united, rarely separate. Ovary 3-celled. Ovules 2 in each cavity. Styles 3, each 2-cleft. Capsule globose.

1. **Phyllanthus polygonoides** Nutt. Perennial. Stem usually diffusely-branched at the base. Branches wire-like. Leaves alternate. Blades oblong or oblong-cuneate, 3"-8" long, entire. Sepals white-margined, acute. Capsules spheroidal. Seeds minutely warty.

In sandy or rocky soil. Spring and fall.

II. CROTON L.

Herbs or shrubs, monœcious or rarely diœcious, strongly scented, stellate-pubescent, more or less glandular. Leaves mostly alternate, entire, toothed, or lobed. Flowers in axillary terminal clusters. Staminate flowers uppermost. Sepals 4-6, usually 5. Petals usually present, but small or rudimentary, alternating with the gland. Stamens 5 or more. Pistillate flowers clustered below the staminate. Sepals 5-10. Petals usually wanting. Ovary mostly 3-celled. Ovule 1 in each cavity. Styles one, twice or many times 2-cleft. Capsule mostly splitting into three 2-valved carpels.

Leaves toothed; staminate calyx 4-lobed, pistillate 5-lobed.

1. *C. glandulosus*.

Leaves entire; staminate calyx 3-5-lobed, pistillate 5-12 lobed.

2. *C. capitatus*.

1. **Croton glandulosus** L. GLANDULAR CROTON. Annual, monœcious, rough with stellate hairs, and somewhat glandular. Stem erect 8'-30' high. Leaves oblong, linear-oblong or ovate, ½'-3' long, coarsely serrate, bearing two glands at the base of the blade. Flower clusters terminal or axillary, the staminate in spikes, the pistillate at the base of the staminate. Capsule sub-globose about 2½" in length.

In sandy soil. March-December. Common.

2. **Croton capitatus** Michx. CAPITATE CROTON. Annual, monœcious, densely stellate-pubescent. Leaves lanceolate, oblong or ovate, entire, obtuse, or cordate at the base. Flower clusters at the ends of the branches. The staminate with 5-parted calyx, 5 petals. The pistillate flowers with 7-12 sepals, no petals. Capsule depressed-globose, 3"-3½" in diameter.

In dry soil. May-October.

III. TRAGIA (Plum.) L.

Perennial, monœcious herbs, or shrubs, usually armed

with stiff, stinging hairs. Leaves alternate, entire, toothed or lobed, mostly cordate, petioled. Flowers in racemes, or spicate-racemes, bracteolate, apetalous. Staminate flowers with 3-5 sepals, and mostly with 1-3 stamens. Pistillate flowers with 3-8 sepals. Ovary 3-celled. Ovules solitary. Styles 3, often united to above the middle. Capsule 3-lobed, separating into three 2-valved carpels.

Staminate calyx 3-lobed; stamens 3. 1. *T. Nepetaefolia*.

Staminate calyx 4-5-lobed; stamens 4 or 5.

2. *T. ramosa*.

1. **Tragia nepetaefolia** Cav. CATNEP TRAGIA. Perennial, hispid with stinging hairs. Stem erect or reclining, 6'-15' long. Leaves triangular-ovate or lanceolate, 5"-24" long, dentate-serrate, cordate at the base. Staminate flowers with 3-lobed calyx and 3 stamens. Pistillate flowers with 5-lobed calyx. Capsule 3" in diameter, hirsute.

In sandy soil. May-October.

2. **Tragia ramosa** Torr. BRANCHING TRAGIA. Perennial, bristly, with stinging hairs. Leaves lanceolate to triangular-lanceolate, coarsely and sharply serrate, truncate or cordate at the base. Racemes few-flowered. Staminate flowers with a 4-5 lobed calyx, 4-6 stamens. Pistillate flowers with a 5-lobed calyx subtended by a 3-lobed bract. Capsule depressed, bristly.

In dry soil. May-August. Wichita Mountains.

IV. STILLINGIA L.

Monœcious, glabrous herbs or shrubs, with simple or branched stems, alternate or, rarely, opposite, entire or toothed leaves, often with two glands at the base, the flowers bracteolate in terminal spikes, apetalous, the bractlets 2-glandular. Staminate flowers several together in the axils of the bractlets, the calyx slightly 2-3-lobed. Pistillate solitary in the axils of the lower bractlets. Calyx 3-lobed, ovary 2-celled. Capsule 2 or 3 lobed, separating into 2 or 3 2-valved carpels.

1. **Stillingia sylvatica** L. QUEEN'S DELIGHT. Perennial herb. Stems usually several together, 1°-3½° tall, simple or umbellately branched above. Leaf-blades lanceolate to elliptic, 5"-4' long, acute, serrulate. Capsule 5"-7" in diameter.

In dry soil. March-October. Common.

V. CNIDOSCOLUS Pohl

Perennial monœcious herbs or shrubs, with stinging-bristly foliage, and entire, lobed, or divided petioled leaves, the flowers in cymes. Flowers apetalous. Staminate flowers on the upper part of the cymes, with a corolla-like, 5-lobed calyx, the stamens usually numerous (10 or more) and in several series, their filaments mostly united at the base. Pistillate flowers in the lower forks of the cymes. Capsule ovoid or sub globose, easily separating into 2-valved carpels.

1. *Cnidoscolus stimulosus* (Michx.) Engelm & Gray. SPURGE NETTLE. Perennial herb, armed with stinging hairs. Stem 4'-3½' tall. Leaves nearly orbicular in outline, 3'-12' broad, truncate, or cordate at the base, deeply 3-5-lobed, the lobes entire, toothed or pinnatifid. Calyx of the staminate flower salver-form, white or pink, 10"-20" broad. Capsule oblong, 5"-8" long, papillose, wrinkled.

In sandy soil. March-August. Central part of the state.

V. CHAMÆSYCE S. F. Gray.

Annual or perennial herbs or shrubs. Stems often radially branched at the base, the branches ascending or prostrate, sometimes creeping, forking. Leaves entire or toothed, more or less oblique at the base, opposite. Involucres solitary in the axils or in axillary cymes. Glands 4, sessile or stalked. Capsule smooth, sometimes pubescent, the angles sharp or rounded.

Leaves entire; seeds smooth.

1. *C. serpens*.

Leaves serrate or dentate; plants prostrate or spreading.

Herbage glabrous.

2. *C. serpyllifolia*.

Herbage pubescent, or puberulent.

3. *Preslii*.

1. *Chamaesyce serpens* (H.B.K.) Small. ROUND-LEAVED SPREADING SPURGE. Annual, glabrous. Stem prostrate, 2'-12' long, much branched. Leaves orbicular to oval, 1"-3" long, entire. Involucres solitary in the axils, bearing 4 glands. Capsule nodding, 1" in diameter.

Prairies. March-October.

2. *Chamaesyce serpyllifolia* (Pers.) Small. THYME-LEAVED SPURGE. Annual, dark green or becoming reddish, glabrous. Stem prostrate or ascending, 4'-12' long. Leaves oblong to spatulate,

2"-6" long, nearly entire or serrulate to below the middle. Involucres usually solitary in the axils of the leaves. Capsule 1" broad.

In dry soil. May-September.

3. *Chamaesyce Preslii* (Guss.) Arthur. UPRIGHT SPOTTED SPURGE. Annual, glabrous or sparingly pubescent. Stem 7'-24' tall. Leaves opposite, oblong, or linear-oblong, 3-nerved, unequally serrate, often with a red blotch and red margins. Capsule glabrous, 1" in diameter.

Fields and thickets. May-October.

VII. *DICHROPHYLLUM* Kl. & Garcke.

Annual, caulescent herbs, with the erect stems often topped with a several-rayed umbel. Leaves scattered below the umbel, above it opposite or whirled, often petal-like and showy, entire. Involucres campanulate, in rather dense cymes, pubescent without and within. Lobes fringed. Glands 5, with white or pink petal-like appendages. Capsule exserted, large pubescent, the lobes rounded.

1. *Dichrophyllum marginatum* (Pursh.) Kl. & Garcke. SNOW-ON-THE-MOUNTAIN. Annual, glabrous or pubescent. Stem erect, 10'-36' tall. Leaves excepting the whorl subtending the umbel, scattered, ovate to obovate, 10"-3½' long, entire. Rays of the umbel forked. Bracts large, white-margined. Capsule depressed globose, 3" in diameter, pubescent.

In dry soil. May-October. Common.

VIII. *TITHYMALOPSIS* Kl. & Garcke.

Perennial herbs, with tough rootstocks and glabrous or pubescent foliage. Stems solitary or tufted, topped by several-rayed umbels. Leaves alternate or scattered below the umbels, above it opposite or whorled, entire, more or less leathery. Glands sessile or stalked, with white, pink or rose petal-like appendages. Capsule exserted, lobes rounded. Seeds narrowed upward, punctate.

1. *Tithymalopsis corollata* (L.) Kl. & Garcke. FLOWERING SPURGE. Perennial, glabrous or pubescent. Stem erect, 10'-36' tall. Leaves linear, oblong or oblong-spatulate, 10"-20" long, entire. Involucres mostly terminal. Capsule erect, 1"-2" in diameter.

In dry soil. April-October.

IX. TITHYMALUS (Tourn.) Adans.

Annual or perennial herbs, with simple or branched stems, which are topped by several-rayed umbel-like cymes. Leaves below the umbel usually scattered or alternate. Bracts of the umbel quite different from the stem-leaves. Blades entire or toothed. Glands 4, the missing one represented by a thin, often ciliate, lobe. Capsule exserted, smooth or tuberculate.

1. **Tithymalus missouriensis** (Norton) Small. **RETICULATE-SEEDED SPURGE.** Annual, glabrous. Stem erect, 4'-15' high, topped by a compound 3-rayed umbel. Leaves, except those subtending the umbel, scattered, spatulate or oblong, 5"-18" long, serrate to below the middle. Involucres solitary in the axils. Capsule 1½" in diameter, with elongated warts.

Plains and prairies. May-August.

X. POINSETTIA Graham

Annual or perennial herbs or shrubby plants, with green or partially often more highly colored, foliage. Leaves alternate below, opposite above, similar throughout or very variable. Stipules gland-like. Involucres in axillary or terminate cymes, or solitary, the lobes fringed. Glands fleshy, solitary, or rarely 3 or 4, sessile or short-stalked, the missing ones represented by narrow lobes. Capsule exserted, the lobes rounded.

1. **Poinsettia heterophylla** (L.) Kl. & Garcke. **VARIOUS-LEAVED SPURGE.** Annual or biennial, pubescent or nearly glabrous. Stem erect, 1°-3° tall, leafy at the ends of the branches. Leaves alternate, 6'-12' long. Leaflets 9-21 ovate-lanceolate or oblong-lanceolate or dentate, the uppermost often fiddle-shaped and blotched with red. Involucres clustered at the ends of branches. Capsule 3" in diameter.

In sandy soil. April-November.

FAMILY 47. ANACARDIACEÆ. SUMAC FAMILY.

Trees or shrubs, with acrid, resinous, or milky sap, usually alternate leaves, and polygamo-dioecious or perfect, regular flowers. Leaves pinnately 3-many foliolate, or

simple, without stipules. Flowers small, in crowded clusters. Calyx 3-7-cleft. Petals 3-7. Stamens as many, or twice as many, inserted at the base of the disk. Ovary in the pistillate flowers 1 or 4 or 5-celled. Ovules 1 in each cavity. Fruit a drupe.

Styles terminal; leaves compound; fruit nearly symmetrical.

Fruit densely pubescent, its stone smooth.

Flowers in dense, terminal panicles, appearing after the leaves. **I. *Rhus*.**

Flowers in clustered spikes, appearing before the leaves. **II. *Schmaltzia*.**

Fruit glabrous, or sparingly pubescent, its stone striate. **III. *Toxicodendron*.**

Styles lateral; leaves simple; fruit gibbous.

IV. *Cotinus*.

I. *RHUS*. (Tourn.) L.

Trees or shrubs, with alternate odd-pinnate leaves, no stipules, and small polygamous flowers in terminal panicles. Pistil 1, ovary 1-ovuled. Styles 3, terminal. Drupe small, 1-seeded, sub-globose, pubescent.

Rachis of the leaf wing-margined. 1. *R. copallina*.

Rachis of the leaf nearly terete. 2. *R. glabra*.

1. *Rhus copallina* L. UPLAND SUMAC. A shrub. Leaves pinnate, 6'-12' long. Leaflets 9-12, ovate-lanceolate or oblong-lanceolate, entire or few-toothed toward the apex. Rachis wing-margined between the leaflets. Flowers polygamous, green, in dense, terminal panicles. Drupe compressed, crimson, covered with short fine acid hairs.

In dry soil. May-August. Common.

2. *Rhus glabra* L. SMOOTH UPLAND SUMAC. A shrub, glabrous and somewhat glaucous. Leaflets 11-31, lanceolate or oblong-lanceolate, sharply serrate, rachis not winged. Inflorescence and fruit similar to preceding species.

In dry soil. May-August. Common.

II. SCHMALTZIA Desv.

Shrubs with polygamo-dioecious, small, green flowers unfolding before the 3-foliolate alternate leaves. Flowers spicate or capitate. Ovary 1-ovuled. Styles 3, short. Fruit a small pubescent drupe.

Leaflets 1'-3' long, crenate-dentate, acutish.

1. *S. crenate*.

Leaflets 6"-18" long, obtuse or obtusish, with few rounded teeth or lobes.

2. *S. trilobata*.

1. **Schmaltzia crenata** (Mill.) Greene. SWEET-SCENTED SUMAC. A shrub. Leaves petioled, 3-foliolate, aromatic. Leaflets ovate or rhomboid, crenate or crenate-dentate, with numerous, large teeth. Flowers yellowish-green, in clustered spikes. Drupe globose, red, pubescent.

In rocky woods. March-April.

2. **Schmaltzia trilobata** Nutt. ILL-SCENTED SUMAC. A glabrous or somewhat hairy shrub. Leaves petioled, 3-foliolate, unpleasantly odorous. Leaflets sessile, ovate or oval, all crenately few-lobed or toothed, or sometimes entire. Flowers and fruit as in preceding species.

Sandy and rocky soil. March.

III. TOXICODENDRON (Tourn.) Mill.

Small trees, shrubs, or climbing vines, with 3-foliolate or pinnate leaves, poisonous to the touch, and axillary panicles of small, polygamous flowers unfolding after the leaves. Calyx 5-cleft. Petals and stamens 5. Drupes glabrous or sparingly pubescent.

Glabrate, or somewhat pubescent; leaflets thin, entire or sinuate; fruit not papillose.

1. *T. radicans*.

Densely pubescent; leaflets firm in texture, deeply 3-7-lobed; fruit papillose.

2. *T. Toxicodendron*.

1. **Toxicodendron radicans** (L.) Kuntze. POISON IVY. A woody vine, climbing by numerous, aerial rootlets, or erect and bushy. Leaves petioled, 3-foliolate, leaflets ovate or rhombic, entire or sparingly dentate or sinuate. Flowers green in loose, axillary panicles. Drupe globose-oblong, glabrous or sparingly pubescent.

Thickets and along fences. May-June. Common.

2. *Toxicodendron toxicodendron* (L.) Britton. POISON OAK. A low branching shrub, spreading by underground branches, the young shoots densely pubescent. Leaves long-petioled, 3-foliolate. Leaflets ovate to obovate, irregularly lobed, toothed or sinuate-margined. Panicles long. Fruit papillose, depressed-globose.

Dry woods. April-May. Common.

IV. *COTINUS* Adans.

Shrubs or small trees, with a ternate-petioled ovate, oval, or obovate entire leaves, and small, polygamous flowers in large, terminal panicles. The calyx 5-parted. Petals longer than the calyx. Stamens 5. Drupe obliquely oblong or oval, compressed, gibbous, 1-seeded.

1. *Cotinus americanus* Nutt. CHITTAM-WOOD. A small, widely branched tree. Leaves oval or slightly obovate. Flowers green, borne in loose, large, terminal panicles, pedicels elongating to 1'-1½' and becoming very plumose. Drupe reticulate-veined, 2" long.

Rocky hills. April-May.

FAMILY 48. ILICACEÆ. HOLLY FAMILY.

Shrubs or trees, with watery sap, and alternate-petioled simple leaves. Flowers axillary, small, clustered or solitary, white, mainly polygamo-diœcious, regular. Stipules minute or none. Calyx 3-6-parted. Petals 4-6, distinct or slightly united at the base, hypogynous, deciduous. Stamens hypogynous, as many as the petals or sometimes more. Ovary 1, superior, 3-several-celled. Stigma discoid or capitate. Fruit a small berry-like drupe, enclosing several nutlets.

I. *ILEX* L.

Shrubs or trees, with entire, dentate or spiny-toothed, minutely stipulate leaves, and axillary, cymose or solitary, perfect or polygamous flowers. Calyx small, 4-5-cleft or toothed. Petals 4-9, somewhat united at the base, oblong, obtuse. Stamens of the same number, adnate to the base of the corolla. Berry-like drupe globose.

1. **Ilex epaca** Ait. AMERICAN HOLLY. A tree of slow growth. Leaves elliptical or obovate, evergreen, glabrous on both sides, spiny-tipped, spinose-dentate. Staminate cymes 3-10-flowered. Fertile flowers mostly scattered and solitary. Drupe globose or globose-oblong, red. Nutlets ribbed.

In moist woods. April-June. Southeastern part of state.

FAMILY 49. CELASTRACEÆ. STAFF-TREE FAMILY.

Shrubs or trees or twining vines. Leaves alternate or opposite, simple. Flowers regular, generally perfect, sometimes diœcious, small. Calyx 4-5 lobed, or parted. Petals 4-5, spreading. Stamens inserted on the disk, alternate with the petals. Ovary mostly 3-5-celled. Fruit a dehiscent 2-5-celled pod.

Leaves opposite; erect or decumbent shrubs.

I. **Euonymus.**

Leaves alternate; woody vine.

II. **Celastrus.**

I. EUONYMUS (Tourn.) L.

Shrubs, with opposite-petioled or serrate leaves, and perfect, cymose, axillary, greenish or purple flowers, Calyx 4-5-cleft. Petals 4-5 inserted beneath the 4-5-lobed disk. Stamens 4 or 5, inserted on the disk. Ovary 3-5-celled, the cavities 1-2-seeded.

1. **Euonymus atropurpureus** Jacq. WAHOO. A shrub or small tree, 6°-25° high. Leaves ovate-oblong or elliptic 1½'-5' long, acuminate at the apex, acute or obtuse at the base, puberulent, crenulate-serrulate. Flowers purple, 5"-6" broad. Petals commonly 4, obovate. Capsule smooth, deeply 3-4 lobed, 6°-8° broad.

Woods. May-June. Common.

II. CELASTRUS L.

Usually twining vines or shrubs. Leaves alternate, entire or toothed. Flowers in axillary or terminal racemes or panicles, diœcious. Sepals and petals 5. Stamens 5. Capsule 2-4-celled.

1. *Celastrus scandens* L. CLIMBING BITTERSWEET. A twining, woody vine. Leaves alternate, ovate, oval or obovate, 2'-4' long, glabrous on both sides, acuminate or acute at the apex, acute or rounded at the base, crenulate. Flowers greenish, about 2" broad, in terminal compound racemes. Petals crenate, much longer than the calyx-lobes. Capsule yellow or orange, 5"-6" in diameter, opening in autumn.

May-June. In rich soil. Frequent.

FAMILY 50. STAPHYLEACEÆ. BLADDER-NUT FAMILY.

Trees or shrubs, with mostly opposite, odd-pinnate or 3-foliolate stipulate leaves, and regular, perfect flowers in terminal or axillary clusters. Sepals, petals and stamens usually 5. Carpels mostly 3. Fruit a dehiscent, bladdery capsule in the following genus.

I. STAPHYLEA L.

Shrubs with opposite 3-foliolate or pinnate leaves, and axillary drooping racemes or panicles of white flowers. Pedicels jointed. Petals the same number as the sepals and about equaling them. Ovary 2-3-parted, the lobes 1-celled. Ovules numerous in each cavity. Capsule 2-3-lobed. Seeds globose.

1. *Staphylea trifolia* L. AMERICAN BLADDER-NUT. A branching shrub. Young leaves and petioles pubescent. Mature foliage glabrate. Leaflets ovate or oval, finely and sharply serrate. Flowers campanulate, racemed. Pedicels bracted at the base. Capsule much inflated, about 2' long, 1' wide.

In moist woods and thickets. April-May.

FAMILY 51. ACERACEÆ. MAPLE FAMILY.

Trees or shrubs, with abundant, often sugary sap. Leaves opposite, simple and palmately lobed, or pinnate, without stipules. Flowers regular, mostly somewhat monœcious or diœcious, in axillary and terminal cymes or racemes. Calyx 4-9-parted. Petals as many as the

lobes of the calyx or none. Stamens 4-12, hypogynous. Ovary 2-celled. Styles 2. Fruit a double key.

I. ACER (Tourn.) L.

Characters of the genus the same as for the family.

Leaves simple, palmately lobed.

Flowers in dense, sessile, lateral clusters, unfolding before the leaves.

Petals none; ovary tomentose, samaras divergent.

1. *A. saccharinum*.

Petals present; ovary glabrous, samaras incurved.

2. *A. rubrum*.

Flowers corymbose, lateral, unfolding with the leaves.

Leaves pale and nearly glabrous beneath.

3. *A. saccharum*.

Leaves green and pubescent, at least on the veins, beneath.

4. *A. nigrum*.

Leaves pinnate.

5. *A. Negundo*.

1. **Acer saccharinum** L. SILVER MAPLE. A large tree. Leaves 4'-6' long, deeply 5-lobed, coarsely and irregularly dentate, green above, silvery white beneath. Flowers greenish to red, in corymbs. Stamens 3-6. Samaras pubescent, divaricate.

Along streams. February-April. Cultivated.

2. **Acer rubrum** L. SCARLET MAPLE. Large tree. Twigs reddish. Leaves sharply 3-5-lobed, the lobes irregularly dentate. Flowers red or yellowish in sessile lateral clusters. Stamens 3-6. Samaras glabrous, slightly incurved.

In swamps and low grounds. March-April. Eastern and central part of the state.

3. **Acer saccharum** Marsh. SUGAR MAPLE. A large tree. Leaves 3'-6' long, 3-7-lobed, the lobes acuminate, irregularly sinuate, the sinuses rounded. Flowers greenish-yellow, in lateral or terminal corymbs, drooping on capillary hairy pedicels, appearing with the leaves. Petals none. Samaras glabrous, slightly diverging.

In rich woods. April-May. Southeastern part of the state.

4. **Acer nigrum** Michx. BLACK SUGAR MAPLE. A large tree with rough, blackish bark. Leaves similar to preceding, but lobes much

broader and shorter, with few undulations or frequently entire, the basal sinus often narrow. Samaras slightly more divergent.

In rich woods. April-May. Eastern part of state.

5. **Acer Negundo** L. BOX ELDER. A small tree. Leaves opposite, pinnately 3-5 foliolate. Leaflets ovate, lobed, toothed or entire, flowers diœcious, drooping, appearing a little before the leaves. Samaras glabrous, 1'-1½' long.

Along streams. April. Common.

FAMILY 52. ÆSCULACEÆ. BUCKEYE FAMILY.

Trees or shrubs, with opposite-petioled, digitately 3-9-foliolate leaves, and conspicuous, polygamous, irregular flowers in terminal panicles, the bark of an unpleasant odor. Calyx 5-lobed or 5-cleft, the lobes unequal.

Petals 4-5, unequal, clawed. Stamens 5-8, hypogynous. Ovary 3-celled. Ovules 2 in each cell. Capsule leathery, globose or slightly 3-lobed, smooth or spiny, 1-3-celled. Seeds large, shining, cotyledons very thick.

I. ÆSCULUS L.

Characters of the genus the same as for the family.

Capsule spiny, at least when young; stamens exserted.

A tree; leaflets 5-7, pubescent. 1. *Ae. glabra*.

A shrub; leaflets 7-9, glabrate. 2. *Ae. arguta*.

Capsule glabrous; stamens scarcely exceeding the petals. 3. *Ae. octandra*.

1. **Æsculus glabra** Willd. OHIO BUCKEYE. A large tree. Leaflets generally 5. Flowers small. Corolla of 4 upright, pale yellow petals. Stamens curved, about twice as long as the petals. Fruit prickly when young. •

Along streams. Central and eastern Oklahoma. April-May.

2. **Æsculus arguta** Buckl. SHRUBBY or WESTERN BUCKEYE. A shrub. Twigs, young petioles, leaves and inflorescence somewhat pubescent, becoming glabrate. Leaflets 7-9, unequally serrate. Flowers yellow, the center reddish. Stamens exserted, curved. Fruit very spiny when young.

Dry soil. Arbuckle Mountains. March-April.

3. *Æsculus octandra* Marsh. **YELLOW SWEET BUCKEYE.** A large tree. Leaves with 5-7 leaflets. Flowers in a short, dense panicle. Petals 4, long-clawed, in 2 unlike pairs, bending inward. Blades of the longer pair very small. Fruit smooth.

Woods. April-May.

FAMILY 53. SAPINDACEÆ. SOAPBERRY FAMILY.

Trees or shrubs, with watery sap, rarely herbaceous vines. Leaves alternate, mostly pinnate or palmate, without stipules. Flowers polygamo-diœcious, regular or slightly irregular. Calyx of 4 or 5 sepals. Petals 3-5. Stamens 5-10. Ovary 1, 2-4-lobed or entire, 2-4-celled, ovules 1 or more in each cell. Fruit a leathery or membranous capsule, or berry-like.

I. *SAPINDUS* (Tourn.) L.

Trees or shrubs, with alternate abruptly-pinnate leaves, and regular polygamo-diœcious flowers in terminal or axillary racemes or panicles. Sepals 4-5, imbricated in 2 rows. Petals 4-5, with a scale at the base. Stamens 8-10, upon the hypogynous disk. Ovules with 2-4 cavities. Ovules 1 in each cavity. Fruit a globose berry with 1-3 seeds.

1. *Sapindus Drummondii* H. & A. **DRUMMOND'S SOAPBERRY. WILD CHINA-TREE.** A tree with maximum height of 50°. Leaflets 4-9 pairs, obliquely-lanceolate, sharply-acuminate, entire, 1½'-4' long. The rachis of the leaf not winged. Flowers white, in a long panicle. Fruit mostly globose, 4"-7" in diameter.

River valleys and hillsides. Common. May-June.

FAMILY 54. RHAMNACEÆ. BUCKTHORN FAMILY.

Erect or climbing shrubs, or small trees, often thorny. Leaves simple with stipules, alternate, often 3-5-nerved. Inflorescence commonly of axillary or terminal cymes, corymbs or panicles. Flowers small, regular, perfect or polyg-

amous. Calyx tube 4-5, inserted with the petals and opposite them. Anthers short, versatile. Ovary 2-5-celled. Ovules 1 in each cavity. Fruit a drupe or capsule. Seeds solitary in the cavities.

I. CEANOTHUS L.

Shrubs, leaves alternate-petioled. Flowers perfect, in terminal panicles or corymbs formed of little umbel-like clusters. Calyx tube top-shaped or hemispherical, with a 5-lobed border. Petals 5, with hoods, on the slender claws. Stamens 5. Fruit dry, 3-lobed, splitting when ripe into 3 carpels.

1. *Ceanothus americanus* L. NEW JERSEY TEA. RED-ROOT. Leaves ovate or ovate-oblong, 1'-3' long, acute or acuminate at the apex, obtuse or subcordate at the base, finely pubescent, serrate all around, strongly 3-nerved. Peduncles terminal and axillary. Fruit depressed, about 2" high, nearly black.

Dry, open woods and prairies. Common. May-July.

FAMILY 55. VITACEÆ. GRAPE FAMILY.

Climbing, woody vines, with watery sap, with stem swollen at the insertion of the petioles, alternate, simple, or compound leaves with stipules, and small, regular, greenish, perfect or polygamo-diœcious flowers, in panicles, racemes, or cymes. Calyx entire or 4-5-toothed. Petals 4-5. Stamens 4-5, opposite the petals. Ovary 2-6-celled. Ovules 1 or 2 in each cavity. Fruit a 1-6 celled berry.

Leaves not digitately compound.

Petals united into a cap, falling away without separating.

I. *Vitis*.

Petals separate, spreading.

II. *Ampelopsis*.

Leaves digitately compound.

III. *Parthenocissus*.

I. VITIS (Tourn.) L.

Climbing woody vines, mostly with tendrils. Leaves simple, palmately-veined or lobed. Stipules small, deciduous. Flowers mostly diœcious, or polygamo-diœcious, rarely perfect. Petals hypogynous or perigynous, often united at the apex, in a cap, and not expanding. Stamens inserted between the lobes of the disk. Ovary usually 2-celled, 4-ovuled. Fruit juicy 1-4 seeded.

Leaves woolly beneath; twigs woolly or hairy.

1. *V. cinerea*.

Leaves glabrate, sometimes slightly pubescent when young.

Leaves 3-7-lobed; lobes acute or acuminate.

2. *V. vulpina*.

Leaves sharply dentate, scarcely-lobed.

Bark loose; pith interrupted by the solid nodes.

High-climbing; leaves large, berries sour.

3. *V. cordifolia*.

Low; leaves small; berries sweet.

4. *V. rupestris*.

Bark close; pith continuous through the nodes.

5. *V. rotundifolia*.

1. *Vitis cinerea* Engelm. DOWNY GRAPE. Climbing, branches angled, young shoots and petioles mostly floccose-pubescent. Bark loose. Pith interrupted. Tendrils intermittent. Leaves dentate, or somewhat 3-lobed, rather densely floccose-pubescent. Inflorescent loose. Berries black, without bloom 3"-4" in diameter. Pleasantly acid.

Common along streams. May-June.

2. *Vitis vulpina* L. SWEET-SCENTED GRAPE. Climbing or trailing, glabrous throughout. Pith interrupted, the diaphragm thin. Tendrils intermittent. Leaves almost all sharply 3-7-lobed, the sinuses angular, shining. Inflorescence compact or becoming loose. Berries bluish-black, with a bloom, 4"-5" in diameter, rather sweet.

Along river banks. May-June. Lincoln County.

3. *Vitis cordifolia* Michx. FROST GRAPE. High-climbing; the twigs glabrous or slightly pubescent, terete or indistinctly angled. Pith interrupted by thick diaphragms. Internodes long. Tendrils intermittent. The stem sometimes 1° in diameter or more. Leaves

glabrous, or sparingly pubescent on the veins, sharply and coarsely dentate with very acute teeth, sometimes slightly 3-lobed. Berries black, shining, about 3" in diameter, ripening after frost.

Moist thickets and along streams. Common. May-June.

4. **Vitis rupestris** Scheele. SAND or SUGAR GRAPE. Low, bushy or sometimes climbing, glabrous or somewhat floccose-pubescent on the younger parts. Pith interrupted. Tendrils forked, intermittent or often wanting. Leaves pale green, shining, sharply dentate with coarse teeth, or sometimes incised, the sides often folded together. Berries black, with a bloom, sweet.

Sandy banks and hills. April-June.

5. **Vitis rotundifolia** Michx. MUSCADINE. SOUTHERN FOX GRAPE. Trailing or high-climbing, glabrous. Tendrils simple, intermittent. Bark close. Pith continuous through the nodes. Leaves nearly orbicular, dark green, shining, dentate with large, triangular teeth. Berries few, purple, 5"-9" in diameter, without bloom, tough, musky.

In moist, often sandy, soil. May. Payne and McCurtain counties.

II. AMPELOPSIS Michx.

Climbing, woody vines or bushy, with few tendrils and firm tissues. Leaves alternate, simple and toothed, or lobed, or bi-pinnately compound. Flowers polygamo-diœcious or polygamo-monœcious. Petals 5, separate, spreading. Floral envelopes mostly in 5's. Disk cup-shaped. Ovary 2-celled. Ovules 2 in each cavity. Berries 2-4 seeded, the flesh thin, inedible.

Leaves coarsely serrate, or slightly 3-lobed.

1. *A. cordata*.

Leaves bi-pinnately compound.

2. *A. arborea*.

1. **Ampelopsis cordata** Michx. SIMPLE-LEAVED AMPELOPSIS. Glabrous, climbing, the branches nearly terete. Tendrils few or none. Leaves broadly ovate, coarsely serrate, glabrous on both sides. Panicles small, loose, with 2-3 main branches. Berries bluish, 2"-3" in diameter, inedible.

Swamps and river-banks. May-June. Common.

2. **Ampelopsis arborea** (L.) Rusby. PEPPER-VINE. Glabrous, bushy, sometimes climbing. Tendrils often wanting. Leaves bi-pinnate, or the lowest tri-pinnate. Leaflets ovate or rhombic-ovate, sharply serrate. Panicles short, cymose. Berries black, depressed-globose, about 3" in diameter, inedible.

In rich moist soil. May-July. Frequent in southern part of state.

III. PARTHENOCISSUS Planch.

Trailing or climbing vines, with forking tendrils, whose tips often bear adhering disks, or sometimes merely coiling, with digitately-compound leaves, the leaflets 5-7. Flowers perfect or polygamo-diœcious, in compound cymes. Calyx pedicelled, petals 5, expanding, often early deciduous. Disk obsolete or wanting. Stamens 5. Ovary 2-celled. Ovules 2 in each cavity. Berries with scant pulp, inedible.

1. Parthenocissus quinquefolia (L.) Planch. VIRGINIA CREEPER. High-climbing or trailing, glabrous or pubescent. Tendrils usually numerous, and often provided with terminal, adhering expansions. Leaves petioled, digitately 5-foliolate. Leaflets stalked, oval or oblong-lanceolate, coarsely toothed, at least above the middle. Panicle spreading. Berries blue, about 6" in diameter. Peduncles and pedicels red.

In woods and thickets. May-July. Common.

FAMILY 56. TILIACEÆ. LINDEN FAMILY.

Trees or shrubs, rarely herbs. Leaves alternate, with stipules. Flowers perfect, in cymes, corymbs or panicles. Sepals 5. Petals 5 or fewer, or wanting. Stamens many, inserted on a swollen disk. Ovary 2-10-celled, with 1 or more ovules in each cell. Fruit 1-10-celled, dry or berry-like.

I. TILIA (Tourn.) L.

Trees, with serrate, cordate, mainly inequilateral leaves, and axillary or terminal, cymose, white or yellowish flowers. Sepals 5. Petals 5, spatulate, often with small scales at the base. Stamens many, in 5 groups. Ovary 5-celled, with 3 ovules in each cell. Stigma 5-toothed. Capsule 1-celled, 1-2-seeded.

1. Tilia americana L. BASS-WOOD. AMERICAN LINDEN. A large tree. Leaves large, green, glabrous or nearly so, usually cordate, 2'-5' wide. Floral bract usually tapering or stalked at the base, fruit ovoid, obscurely ribbed, 4"-5" in diameter.

In rich woods. May-June. Eastern part of state.

FAMILY 57. MALVACEÆ. MALLOW FAMILY.

Herbs or shrubs, with alternate, mostly palmately-veined leaves. Stipules small, deciduous. Flowers regular, perfect, often large, rarely diœcious or polygamous. Calyx of 5, more or less united valvate sepals. Petals 5, hypogynous, convolute. Stamens many, monadelphous, forming a central column around the pistil, united with the bases of the petals. Ovary several-celled, entire or lobed. Fruit capsular, several-celled. Seeds reniform, globose or obovoid.

Stigmas linear, on the inner side of the style-branches.

Carpels beakless, petals obcordate. **I. Malva.**

Carpels beaked; petals truncate. **II. Callirhoe.**

Stigmas capitate, terminal. **III. Malvastrum.**

I. MALVA (Tourn.) L.

Pubescent or glabrate herbs, with dentate, lobed, or dissected leaves, and axillary or terminal, solitary or clustered, perfect flowers. Calyx 5 cleft. Bractlets of the involucels 3. Petals 5. Stamen-column anther-bearing at the summit. Cavities of the ovary several or numerous, 1-ovuled. Carpels arranged in a circle, 1-seeded, beakless. Seed ascending.

1. Malva rotundifolia L. CHEESES. Stems procumbent from a deep biennial root, leaves round-heart-shaped, on very long petioles, crenate, obscurely lobed. Petals twice the length of the calyx, whitish. Carpels pubescent, even.

In waste places. April-November. Oklahoma County.

II. CALLIRHOE Nutt.

Herbs, with lobed or divided leaves, and showy, axillary or terminal, perfect flowers. Bractlets of the involucl 1-3. Calyx deeply 5-parted. Petals cuneate, truncate, often toothed or fimbriate. Stamen-column anther-bearing at the summit. Cavities of the ovary many, 1-

ovuled. Carpels 10-20, arranged in a circle, 1-seeded, beaked at the apex, the beak separated from the cavity by a septum. Seed ascending.

Perennials or biennials.

Involucels present.

1. *C. involucrata*.

Involucels wanting.

Lower petioles strigose.

2. *C. alceoides*.

Lower petioles hirsute.

3. *C. digitata*.

Annual.

4. *C. pedata*.

1. **Callirhoe involucrata** (T. & G.) A. Gray. PURPLE POPPY MALLOW. Perennial. Stems procumbent or ascending. Leaves round-heart-shaped, palmately lobed or cut. Involucel 3-leaved. Peduncles long, slender, and 1-flowered. Flowers reddish-purple, 1'-2½' broad. Carpels rugose-reticulate.

In dry soil. April-August. Common.

2. **Callirhoe alceoides** (Michx.) A. Gray. LIGHT POPPY MALLOW. Perennial. Stems rather slender, 8'-20' high, covered with close-lying stiff hairs. Basal leaves triangular-heart-shaped, palmately-lobed or incised. Stem leaves palmately divided. Involucel none. Flowers pink or white, about 1' broad. Carpels strigose-pubescent and conspicuously rugose-reticulate on the back.

In dry soil. May-August. Oklahoma County.

3. **Callirhoe digitata** Nutt. FRINGED POPPY MALLOW. Resembling the preceding species. Sparingly hirsute or glabrous, erect. Leaves few, round-cordate, 5-7-parted, the cauline commonly with linear divisions. Peduncles sub-racemose, long, filiform. Flowers red-purple to white.

In dry soil. April-July. Frequent.

4. **Callirhoe pedata** A. Gray. TALL POPPY MALLOW. Annual, strigillose or glabrate. Stems 12'-36' tall, simple or branched. Leaves suborbicular in outline, palmate 3-5-lobed, cleft or parted, entire or toothed. Flowers red-purple or sometimes lilac. Petals 10"-14" long, erose at the tip. Carpels slightly wrinkled on the sides.

In dry soil and hillsides. May-August. Payne and Comanche counties.

III. MALVASTRUM A. Gray.

Herbs, with entire, cordate or divided leaves, and axillary or terminal, solitary or racemose, short-pedicelled, perfect flowers. Calyx 5-cleft. Bractlets of the involucels

small, 1-3 or none. Stamen column anther-bearing at the apex. Cavities of the ovary 5-many, 1-ovuled. Carpels indehiscent, their apices pointed or beaked. Seeds ascending.

1. *Malvastrum coccineum* (Pursh.) A. Gray. RED FALSE MALLOW. Perennial, erect or ascending, 4'-10' high, densely silvery stellate-pubescent. Lower leaves ovate-orbicular in outline, slender-petioled, the uppermost nearly sessile, all palmately 3-5-parted. Flowers red (various shades), 6"-9" broad, in dense, short, terminal, spicate racemes. Bractlets of the involucre none. Carpels 10-15, rugose-reticulated, indehiscent, 1-seeded.

Frequent on prairies. April-August. Woods. Kingfisher, Oklahoma and Caddo counties.

FAMILY 58. VIOLACEÆ. VIOLET FAMILY.

Herbs, with simple, alternate leaves, with stipules. Calyx of 5 persistent sepals. Corolla of 5 petals, somewhat zygomorphic. One petal with a spur. Stamens 5, short, the filaments often united around the pistil. Style generally club-shaped, with a one-sided stigma, with an opening leading to its interior. Pod 1-celled, splitting into 3 valves, each bearing a placenta. The seeds are often dispersed by the splitting of the elastic valves.

Sepals more or less prolonged posteriorly. I. *Viola*.

Sepals not prolonged posteriorly. II. *Calceolaria*.

I. VIOLA (Tourn.) L.

Herbs, either leafy-stemmed or stemless. Petaliferous flowers, mostly in early spring, succeeded by cleistogamous flowers, bearing abundant seed. Stamens 5 in the petaliferous flower, the two lowest with appendages that project into the spur or nectar sac of the odd petal, these two stamens alone developed in the cleistogamous flower. Hybridize freely.

Plants stemless; leaves and scapes from a rootstock or from runners.

Petals all beardless: apetalous flowers wanting.

1. *V. pedata*.

Lateral petals bearded: apetalous flowers present.

Cleistogamous flowers ovoid, on short, prostrate peduncles, their capsules usually brown.

Earliest and latest leaf-blades uncut, others pedately 3-7-lobed, parted, or divided; seeds generally buff.

2. *V. triloba*.

Leaf-blades all uncut.

3. *V. papilionacea*.

Cleistogamous flowers, subulate or sagittate, on erect peduncles, their capsules green; foliage nearly glabrous.

4. *V. sagittata*.

Plants with leafy stems: flowers axillary.

Style capitate, beakless; spur short; stipules nearly entire, soon scarious; petals yellow outside.

5. *V. eriocarpa*.

Style much enlarged upward into a globose, hollow summit; stipules large, leaf-like, pectinate at base. Upper leaf-blades entire, or obscurely crenulate; petals twice the length of the sepals.

6. *V. Rafinesquii*.

Upper leaves and middle lobe of stipules plainly crenate; petals large, 2-3 times as long as the sepals.

7. *V. tricolor*.

1. ***Viola pedata* L. BIRD'S-FOOT VIOLET.** Nearly glabrous. Leaves 3-divided, the lateral divisions palmately 3-parted or cleft, the segments linear or spatulate, often 2-4-cleft or toothed near the apex. Corolla 9"-21" broad, the upper petals dark violet, the 3 lower lilac-purple, all beardless. Cleistogamous flowers wanting.

In dry fields and open woods. April-June. Eastern part of state.

2. ***Viola triloba* Schwein. THREE-LOBED VIOLET.** Earliest and late summer leaves usually with uncut blades, reniform, cordate. Those unfolding at flowering time, 3-lobed, the middle segment broad, the lateral divaricate, often coarsely toothed or cleft. Petals deep violet. Cleistogamous capsules ovoid. Seeds buff or brown.

Dry woodlands. April-May. Eastern part of state. One specimen in University of Oklahoma Herbarium.

3. ***Viola papilionacea* Pursh. MEADOW or common BLUE VIOLET.** Plants usually glabrous, from a stout, horizontal-branching root-

stock. Blades often 5' broad, reniform or ovate, cordate, acute or sometimes abruptly pointed. Scapes shorter than the leaves. Corolla deep violet, white or greenish-yellow at the center, sometimes wholly white. Capsules ellipsoid, green or dark purple, 5"-7" long, seeds 1" long, dark brown.

Moist fields and groves. April-May. Frequent.

4. ***Viola sagittata*** Ait. ARROW-LEAVED VIOLET. Glabrous or finely pubescent. Petioles commonly longer than the blades. Blades lanceolate or oblong-lanceolate, 1½'-4' long, distantly and obscurely-toothed above the middle, hastately or sagittately-toothed or cleft at the base. Earliest and latest leaves deltoid ovate, merely crenate at the base. Corolla violet-purple. Capsules 4"-7" long, containing 50-70 brown seeds.

Moist banks and fields. April-May. Lincoln-Cleveland counties.

5. ***Viola eriocarpa*** Schwein. SMOOTHISH YELLOW VIOLET. Pubescent on the upper part of stem and on the lower surface of leaves along veins. Blades ovate to reniform, cordate or truncate, mostly pointed. Cauline leaves only on the upper half of the stem, broadly ovate, subcordate. Lateral petals bearded. Capsule woolly or sometimes glabrous.

Seeds brown, a little more than 1" long.

In low, open woods. May-July. Cleveland County.

6. ***Viola Rafinesquii*** Greene. FIELD PANSY. Glabrous, annual with slender stem, 3'-8' high, often branched from the base. Leaves small, the lowermost 3"-5" wide, suborbicular, on slender petioles, the upper obovate to linear-oblongate, sparingly crenulate. Flowers small, yellowish-white to bluish-white. Seeds light brown, ½" long.

In fields and open woods. March-May. Common.

7. ***Viola tricolor*** L. PANSY. HEART'S EASE. Glabrous or pubescent, 4'-12' high. Stem angled and often branched. Upper leaves oval or lanceolate 6"-12" long, the lower ovate, often cordate, all crenate-serrate. Stipules foliaceous, laciniate or lyrate-pinnatifid. Flowers 8"-12" broad, variously colored with yellow, purple or white.

In waste places and cultivated. April-July.

II. **CALCEOLARIA** Loeffl.

Herbs, rarely shrubs, with mostly opposite leaves, and axillary or racemose flowers. Sepals somewhat unequal. Petals unequal, the lower one longest, gibbous or saccate at the base, the two upper shorter than the lateral ones. Filaments distinct, the lower spurred or glandular. Capsule elastically 3-valved. Seeds ovoid-globose.

1. ***Calceolaria verticillata*** (Ort.) Kuntze. NODDING VIOLET. Stems clustered, ascending or erect, slightly pubescent, 4'-15' high. Leaves alternate, often fascicled. Blades linear, 9"-20" long. Stip-

ules subulate or wanting. Flowers solitary, white, nodding, 2"-3" long. Capsule obovoid, 2" long. Seeds nearly 1" long.

In dry soil. April-July. Wichita Mountains.

FAMILY 59. PASSIFLORACEÆ PASSION-FLOWER FAMILY.

Vines, climbing by tendrils, or erect herbs, with alternate-petioled, usually palmately-lobed leaves, and solitary or clustered, perfect, regular flowers. Calyx-tube short or elongated, persistent. Petals usually 5, inserted on the throat of the calyx, distinct, or in some species united. Stamens 5. Throat of the calyx crowned with a double or triple fringe. Filaments subulate or filiform, monadelphous, or separate. Ovary free from the calyx, 1-celled. Placentæ 3-5, parietal. Styles 1-5. Fruit a berry or capsule, usually many-seeded.

I. PASSIFLORA L.

Climbing, tendril-bearing, herbaceous, or woody vines, with lobed, parted, or entire-alternate or rarely opposite leaves, and large, showy, axillary flowers, on jointed, often bracted peduncles. Calyx-tube cup-shaped or campanulate, deeply 4-5 lobed, the lobes narrow, its throat crowned with a double or triple fringe called the corona. Petals 4 or 5, inserted on the throat of the calyx. Ovary oblong, stalked. Filaments monadelphous in a tube around the stalk of the ovary, separate above. Fruit a many-seeded berry.

1. *Passiflora incarnata* L. PASSION-FLOWER. Twigs finely pubescent or glabrate. Leaf-blades 3'-5' long, glabrous or sparingly pubescent, the lobes finely serrate. Petals pale lavender. Crown lavender and purple. Berries oblong or oval, 1½'-4' long.

Dry soil. April-September. Oklahoma to McCurtain county.

FAMILY 60. LOASACEÆ. LOASA FAMILY.

Herbaceous plants, with either stinging or jointed and rough-barbed hairs, no stipules, calyx-tube adnate to a 1-celled ovary, parietal placentæ, and a single style. Stamens usually very numerous, some of the outer occasionally petaloid. Flowers perfect, often showy.

I. MENTZELIA L.

Erect herbs, mostly annuals, with alternate, entire, lobed or pinnatifid leaves, and terminal, solitary, or cymose flowers. Calyx-tube cylindric, linear or club-shaped. Petals 5, spreading, deciduous. Stamens 20-100. Ovary 1-celled. Styles 3, more or less united. Capsule few-many-seeded. Seeds mostly prismatic, roughened or striate.

1. *Mentzelia oligosperma* Nutt. FEW-SEEDED MENTZELIA. Rough and viscid-pubescent. Leaves ovate or oval, coarsely dentate or sinuate. Flowers yellow, 5"-10" broad, axillary or somewhat cymose, opening in sunshine. Capsule linear, 6"-8" long. Calyx lobes about 3" long, persistent on the capsule.

Prairies and plains. May-July. Oklahoma and Comanche counties.

FAMILY 61. LYTHARACEÆ. LOOSESTRIFE FAMILY.

Herbs or shrubs, mostly with opposite leaves and solitary or clustered, mostly axillary, perfect flowers. Stipules usually none. Calyx persistent, free from the ovary and capsule but inclosing it, the petals and definite stamens borne in its throat, a single style, and numerous small seeds on a central placenta.

I. AMMANNIA (Houst.) L.

Annual, glabrous or glabrate herbs, mostly with 4-angled stems, opposite, sessile, narrow leaves, and small, axillary, solitary or cymose flowers. Calyx campanulate,

globose or ovoid, 4-angled, 4-toothed, often with small appendages in the sinuses. Petals 4. Stamens 4-8, inserted on the calyx-tube. Ovary enclosed in the calyx-tube, nearly globular, 2-4-celled.

1. *Ammannia auriculata* Willd. WRIGHT'S AMMANNIA. Erect, at length widely branching. Leaves sessile, linear-lanceolate or oblong, auriculate at the base. Flowers in axillary, peduncled cymes. Petals purple. Capsule partly enclosed by the calyx.

Low ground. May-June. Frequent.

FAMILY 62. ONAGRACEÆ. EVENING PRIMROSE FAMILY.

Herbs, rarely shrubs or trees. Leaves opposite or alternate, without stipules. Flowers actinomorphic. Limb of the calyx epigynous, 2-4-lobed. Petals 2-4, rarely wanting, quickly falling off. Stamens 1-8. Ovary usually 4-celled. Style thread-like. Stigma entire or 4-lobed. Ovules 1 or more in the inner angle of each cell. Fruit a capsule, berry, or drupe. Seeds 1 or more, smooth or hairy.

Key to Genera of Onagraceæ.

1. Fruit a many-seeded capsule, opening by valves or by a pore.

Stamens equal in length.

Stigma deeply 4-cleft, its segments linear.

I. *Raimannia*.

Stigma entire or slightly 4 toothed.

Calyx-tube longer than the ovary; stigma disk-like, entire.

VI. *Galpinsia*.

Calyx-tube shorter than the ovary; stigma disk-like, slightly 4-toothed.

VII. *Meriolix*.

Stamens unequal in length, the alternate longer.

Ovules and seeds many, on slender funiculi; capsules club-shaped.

Flowers yellow.

II. Kneiffia.

Flowers white, pink, or reddish.

III. Hartmannia.

Ovules or seeds few, sessile, in 1 or 2 rows.

Plants normally acaulescent.

IV. Lavauxia.

Plants caulescent.

V. Megapterium.

2. Fruit indehiscent, nut-like.

Calyx-tube obconic; filaments with scales at the base; ovary 4-celled.

VIII. Gaura.

I. RAIMANNIA Rose.

Usually low, annual, biennial, or perennial caulescent herbs, with prostrate or erect stems. Leaves alternate, sinuate, or pinnatifid. Flowers perfect, yellow, axillary, or sometimes in terminal spikes, nocturnal. Calyx-tube elongated. Calyx-segments 4, finally reflexed. Petals 4, spreading. Stamens 8. Ovary 4-celled, elongated. Stigma deeply 4-cleft. Ovules numerous, in 2 rows. Capsule usually cylindric. Seeds numerous, in 2 rows, terete, crowned by a tubercle.

1. Raimannia laciniata (Hill.) ROSE. CUT-LEAVED EVENING-PRIMROSE. Decumbent or ascending, simple or sometimes branched, glabrous or sparingly hirsute-pubescent. Leaves sessile or the lower petioled, oval-lanceolate, or oblanceolate, sinuate-dentate, or often pinnatifid. Flowers axillary, 5"-15" broad. Calyx lobes reflexed, much shorter than the slender tube. Capsule linear, 1'-1½' long, more or less pubescent, straight or curved upward. Seeds strongly pitted.

In dry, shady soil. May-June. Common.

Var. *grandis* Britton. With larger flowers. Petals 1'-1½' long. Frequent in sandy fields. May-June.

II. KNEIFFIA Spach.

Annual or perennial, caulescent, often shrubby herbs.

Leaves alternate, mostly narrow, entire or shallowly toothed. Buds erect. Flowers yellow, diurnal, in terminal spikes or racemes. Sepals narrow. Ovary usually club-shaped, 4-angled. Stigma 4-cleft. Ovules numerous, on slender stalks, in many rows. Capsule club-shaped, 4-winged or rarely sharply 4-angled. Seeds not angled, without a tubercle.

1. **Kneiffia linifolia** (Nutt.) Spach. **THREAD-LEAVED SUNDROPS.** Erect, simple or diffuse, glabrous below and finely pubescent above. Stem-leaves filiform-linear, entire, crowded. Basal leaves tufted, oblanceolate or spatulate, petioled. Flowers in loose, spike-like racemes, yellow, diurnal, 3"-4" broad. Capsule obovoid, sessile or very nearly so, puberulent, sharply 4-sided but not winged.

Dry soil. May-July. Lincoln County.

III. **HARTMANNIA** Spach.

Annual or perennial, caulescent herbs with branched stems. Leaves alternate, commonly pinnatifid, or lyrate. Buds drooping. Flowers perfect, white, red or purple, diurnal, in terminal spikes or racemes. Calyx-tube funnel-form. Petals 4, spreading. Stamens 8. Ovary elongated, 4-celled. Stigma 4-cleft, ovules numerous, on slender stalks, in many rows. Capsule club-shaped, 4-winged, sessile or stalked. Seeds numerous, not tuberculate.

1. **Hartmannia speciosa** (Nutt.) Small. **SHOWY PRIMROSE.** Erect, perennial, puberulent or finely pubescent. Stem-leaves lanceolate or linear-lanceolate, sinuate or pinnatifid. Basal leaves slender-petioled, oval or oval-lanceolate, repand or pinnatifid at the base. Flowers white or pink. 1½'-3½' broad, loosely spicate. Capsule club-shaped, strongly 4-ribbed, 4-winged, pubescent, 6"-9" long.

Prairies. April-June. Common.

IV. **LAVAUXIA** Spach.

Low, usually acaulescent herbs. Leaves mostly basal, pinnatifid, numerous. Flowers perfect, white, pink, or pale yellow. Calyx-tube slender, dilated at the throat. Petals 4, spreading. Stamens 8. Ovary short, 4-angled. Stigma 4-cleft. Ovules few. Capsules stout, their angles sometimes winged above. Seeds few.

Leaves membranous; capsules beaked, glabrate.

1. *L. triloba*.

Leaves leathery; capsules hardly beaked, pubescent.

2. *L. brachycarpa*.

1. **Lavauxia triloba** (Nutt.) Spach. THREE-LOBED PRIMROSE. Perennial, nearly glabrous throughout. Leaves basal. Blades oblong-lanceolate in outline, 3'-12' long, runcinate-pinnatifid or sinuate, sometimes ciliate. Corolla white or pink, 1'-2½' broad. Petals often 3-lobed. Capsules ovoid, 4-wing-angled, reticulate-veined.

In dry soil. May-July.

2. **Lavauxia brachycarpa** (A. Gray) Britton. SHORT-PODDER PRIMROSE. Low, perennial, acaulescent, softly canescent. Leaves basal, leathery, ovate or nearly oblong, 3'-9' long, lyrate-pinnatifid, or sometimes nearly entire. Flowers yellow, basal. Calyx canescent, its tube 2'-4' long, gradually dilated upward. Petals 1'-1½' long. Capsules elliptic, 8"-9" long, leathery or corky, the angles very thin.

Prairies. April-July. Oklahoma and Murray counties.

V. MEGAPTERIUM Spach.

Low, perennial herbs with stout, spreading stems. Leaves numerous, alternate, narrow, entire or slightly toothed. Flowers perfect, few, but large and showy, axillary, yellow. Calyx-tube much elongated, dilated towards the throat. Petals 4, spreading. Stamens 8. Ovary 4-celled, 4-angled or 4-winged. Stigma 4-cleft. Ovules few, sessile in rows. Capsule broadly 4-winged. Seeds few, crested.

1. **Megapterium missouriensis** (Sims) Spach. MISSOURI PRIMROSE. Stems decumbent or ascending, glabrous, 6'-12' long, leaves thick, linear-lanceolate or oblong-lanceolate, narrowed at the base into a slender petiole, entire or remotely denticulate. Flowers 3'-6' broad. The calyx tube 2'-6' long. Capsule short-stalked, nearly orbicular, very broadly winged, glabrate in our species.

Dry soil. May-July. Frequent.

2. **Megapterium missouriensis**. Var *incana* Gray, with stems and leaves densely silvery canescent. Specimens collected on the limestone hills N. E. of Medicine Park and east of Apache. We believe these to be the largest and showiest of Oklahoma's spring flowers.

VI. GALPINSIA Britton.

Perennial herbs or shrubby plants, with branched stems.

Leaves alternate, entire or toothed. Flowers perfect, yellow, axillary. Calyx-tube slender, narrowly funnel-form, longer than the ovary. Petals 4, spreading. Stamens 8. Ovary 4-celled, elongated. Stigma disk-like, entire. Capsule elongated, narrowed at the base, curved. Seeds sometimes tuberculate.

1. **Galpinsia Hartwegii** (Benth.) Britton. GALPINSIA. Stems more or less branched, but not densely tufted, mostly 8'-16' tall. Blades linear, 5"-15" long, entire, or slightly repand-denticulate. Calyx-tube elongated, gradually dilated. Petals 8"-14" long. Capsule narrowly cylindric, 6"-12" long.

Plains and prairies. April-Fall. Kingfisher and Grady counties.

VII. MERIOLIX Raf.

Biennial or perennial herbs with branched stems, sometimes becoming shrubby. Leaves alternate, narrow, entire, or sharply serrate. Flowers perfect, regular, axillary, yellow. Calyx-tube funnel-form, shorter than the ovary. Calyx-segments narrow, keeled on the back. Petals 4, often blotched at the base. Stamens 8. Ovary 4-celled, 4-angled. Stigma disk-like, 4-toothed. Ovules numerous. Capsule linear, 4-angled, 4-celled, sessile. Seeds longitudinally grooved.

1. **Meriolix serrulata** (Nutt.) Walt. TOOTH-LEAVED PRIMROSE. Erect, simple or branched, canescent or glabrate, 4'-18' high. Leaves linear-oblong, lanceolate or oblanceolate, usually sessile, sharply dentate or denticulate, 1'-3' long, 2"-3" wide. Flowers yellow, axillary, 6"-2' broad. Calyx-tube funnel-form, silvery canescent. Petals obovate, crenulate. Stigma discoid. Capsule sessile, linear-cylindric, silvery canescent, 8"-15" long, about 1" thick, slightly grooved longitudinally.

In dry soil. May-July. Common.

VIII. GAURA L.

Annual, biennial, or perennial herbs, somewhat woody at the base, with alternate, narrow, sessile leaves, and white, pink, or red flowers in terminal spikes or racemes. Calyx usually pubescent, 4-lobed, the lobes reflexed. Petals 4, clawed, unequal. Stamens 8, declined. Ovary 1-celled. Stigma 4-lobed, surrounded by a cup-like border. Ovules

usually 4, pendulous. Fruit nut-like, ribbed or angled, 1-4-seeded. Seeds unappendaged.

Fruit mainly 3-angled, the base and angles rounded.

1. *G. tripetala*.

Fruit contracted into a slender or stout neck-like or pedicel-like base.

Pedicel-like base of the fruit very stout and short, angled or ribbed, but less so than the body of the fruit.

2. *G. coccinea*.

Pedicel-like base of the fruit relatively slender and long.

3. *G. sinuata*.

1. ***Gaura tripetala*** Cav. Stem simple or branched at the base, the branches 12'-20' tall, hirsute. Leaf blades relatively thick, spatulate to oblong, or linear-elliptic, 1'-2' long, acute or slightly acuminate, shallowly but sometimes rather sharply toothed. Spikes elongated. Buds more or less pubescent. Petals 3"-4" long. Fruit pyramidal with the base rounded, mostly 3-angled, 3"-4" long, the faces somewhat transverse-wrinkled.

On plains and prairies. April-July. Oklahoma County.

2. ***Gaura coccinea*** Pursh. SCARLET GAURA. Erect or ascending, much branched, canescent, pubescent or glabrate, 6'-24' high. Leaves oblong, lanceolate or linear-oblong, denticulate, repand or entire, 6"-18" long, 2"-4" wide. Flowers sessile, red, turning scarlet, 4"-5" broad. Fruit sessile, terete below, 4-sided and narrowed above, canescent, 3"-4" long.

Prairies and dry soil. Frequent. May-August.

3. ***Gaura sinuata*** Nutt. WAVY-LEAVED GAURA. Perennial, erect or decumbent, glabrous or sparingly villous. Stem 12'-36' tall, usually naked above. Leaves oblanceolate to lanceolate or nearly linear, sinuate-toothed, 1'-3' long. Calyx slightly pubescent, its tube funnel-form, 1"-2" long. Petals oblong-obovate, 4"-5" long. Stamens shorter than the petals. Fruit about 7" long, glabrous, 4-ribbed and 4-grooved above the stout club-shaped pedicel.

In dry soil. May-July. Common.

FAMILY 63. AMMIACEÆ. CARROT FAMILY.

Herbs, usually with hollow, grooved stems. Flowers small, generally in umbels. Limb of the calyx either wanting or present only as a 5-toothed rim or margin

around the top of the ovary. Petals 5. Stamens 5, inserted on the disk, which is borne by the ovary. Ovary 2-celled and 2-ovuled, ripening into 2 achene-like carpels, which separate from each other. Each carpel bears 5 longitudinal ribs, in the furrows, between which secondary ribs frequently occur. Fruit either flattened laterally (at right angles to the commissure), or dorsally (parallel to the commissure), or nearly terete (not flattened). Pericarp membranous or corky-thickened, usually containing oil-tubes between the ribs or under the ribs, and on the commissural side. Oil-tubes sometimes irregularly scattered, sometimes none.

I. Fruit ribless, covered with hooked prickles.

I. Sanicula.

II. Fruit ribbed, at least its beak, the ribs rarely obsolete. Fruit not bristly. **II. Chærophylum.**

A. Fruit much flattened dorsally, parallel with the commissure. Aculeate or nearly so.

III. Cogswellia.

B. Leafy-stemmed; stylopodium conic or depressed.

IV. Pleiotænia.

C. Fruit not flattened, or flattened laterally (at right angles to the commissure).

1. Petals white, greenish-white or rarely pinkish.

a. Fruit nearly terete, not flattened either laterally or dorsally, or very slightly flattened.

V. Cynosciadium.

b. Fruit laterally flattened.

Fruit tubercled or bristly.

Seed-face concave.

VI. Spermodia.

Seed-face flat.

VII. Ammoselinum.

Fruit smooth, neither tubercled nor bristly.

VIII. Ptilimnium.

I. SANICULA L.

Perennial or biennial, mostly glabrous herbs, with alternate, palmately 3-7-foliolate or pinnatifid leaves, and small, yellowish, white, or purplish, perfect and staminate flowers in compound few-rayed umbels. Umbellets globose. Involucre few-leaved, foliaceous. Calyx-lobes membranous. Petals obovate, or narrower, incurved at the apex, emarginate. Disk flat. Fruit somewhat flattened laterally, sub-globose, covered with hooked bristles. Carpels not ribbed. Oil-tubes usually 5.

Petals and anthers greenish-white; calyx-segments lanceolate, cuspidate; fruit 3" long.

1. *S. marylandica*.

Petals and anthers yellow; calyx-lobes ovate, obtuse; fruit 1½" long, or less.

2. *S. gregaria*.

1. *Sanicula marylandica* L. BLACK SNAKE-ROOT. Stem erect, 18'-48' high. Leaves 5-7 parted, the divisions sharply serrate, acute. Sterile flowers pedicellate, often in separate umbels. Fruit sessile, ovoid, 3" long. Oil tubes 5, large.

In rich woods. May-July.

2. *Sanicula gregaria* Bicknell. CLUSTERED SNAKE-ROOT. Stem slender, 12'-36' tall, umbellately-branched. Leaves 5-foliolate. Leaflets obovate, cleft and serrate. Fruit 1½"-2" long. Oil-tubes 5, small.

In moist woods. May-June.

II. CHÆROPHYLLUM (Tourn.) L.

Annual herbs, with ternately or pinnately decompose leaves and small, compound umbels of white flowers. Involucre none or, rarely, of 1-2 bracts. Involucels of numerous, small bracts. Calyx-teeth obsolete. Petals inflexed at the apex. Stylopodium small, conic. Fruit oblong or linear-oblong, glabrous or pubescent, flattened laterally. Carpels 5-angled, slightly flattened dorsally. Oil-tubes mostly solitary in the intervals. Seed-face channeled.

Fruit not beaked, its ribs slender, narrower than the intervals between them. 1. *C. procumbens*.

Fruit beaked, its prominent ribs mostly as broad as the intervals. 2. *C. Teinturieri*.

1. **Chærophyllum procumbens** (L.) Crantz. SPREADING CHERVIL. More or less pubescent, slender, spreading or erect, 6'-20' high. Leaves ternately decompound, the lower petioled, the upper nearly sessile. Fruit glabrous or minutely pubescent, oblong or linear-oblong, 2"-2½" long.

In moist ground. April-June. Common.

2. **Chærophyllum Teinturieri** Hook. TEINTURIER'S CHERVIL. Similar to the preceding species, much branched, and often taller. Fruit 3"-4" long, less than 1" wide, narrowed above into a distinct beak.

In dry soil. March-May.

III. COGSWELLIA Spreng.

Perennial herbs, acaulescent or nearly so, from thick, fusiform or tuberous roots, with ternate, pinnate, or bipinnate, finely dissected leaves, and compound umbels of white or yellow flowers. Involucre none. Calyx-teeth mostly obsolete. Stylopodium depressed or none. Fruit oval, oblong, or orbicular, glabrous or pubescent, dorsally compressed. Carpels with filiform, dorsal, and intermediate ribs, the lateral ones broadly winged. Oil-tubes 1-4 in the intervals, 2-10 on the commissural side. Seed-face flat or slightly concave.

1. **Cogswellia daucifolia** (Nutt.) M. E. Jones. CARROT-LEAVED PARSLEY. Foliage tomentose, becoming less dense in age. Peduncles 4'-10' high, usually exceeding the leaves. Taproot stout. Leaves finely dissected into short, linear or filiform lobes. Rays of the umbel ½'-1' long. Flowers yellow. Fruit broadly oval, glabrous, about 3" long. Oil tubes 1-3 in the intervals.

Prairies. March-April. Common.

IV. PLEITÆNIA Coult. & Rose.

Perennial, nearly glabrous herbs, with pinnately-decompound leaves, and compound umbels of yellow flowers. Involucre none. Involucels of a few subulate, pubescent, deciduous bracts. Calyx-teeth prominent, triangular. Petals

obovate-cuneate, with long, incurved tip. Stylopodium none. Fruit oval or obovate, much flattened dorsally, thick and corky. Oil-tubes 12-18. Seed flat.

1. *Pleiotænia Nuttallii* (DC.) Coult. & Rose. NUTTALL'S PRAIRIE PARSLEY. Foliage nearly glabrous. Stem 12'-36' high. Roots fusiform. Leaves pinnate, the segments deeply pinnatifid or parted, 1'-3' long. Umbels 6-12 rayed. Pedicels finely pubescent, 1"-2" long. Fruit glabrous, 3"-5" long.

In dry soil. April-May. Common.

V. CYNOSCIADIUM DC.

Glabrous, slender, branching annuals, the lower and basal leaves mostly linear and entire, those of the stem mainly divided into few linear segments. Involucres and involucels of several subulate or narrowly-linear bracts. Flowers small, white, in terminal and lateral-compound umbels. Calyx-teeth short. Fruit ovoid, or oblong, nearly terete, glabrous, strongly ribbed, the lateral ribs larger. Oil-tubes solitary in the intervals and 2 on the commissural side of each carpel. Seed-face flat.

1. *Cynosciadium pinnatum* DC. PINNATE CYNOSCIADIUM. Stems erect or decumbent, 12'-24' high. Basal leaves entire, or pinnately divided. Stem-leaves pinnately divided nearly to the midvein into 3-9 narrowly linear entire segments, the terminal segment much longer than the lateral ones. Umbels 4-10 rayed. Fruit about 2" long, less than 1" wide, crowned by the ovate calyx-teeth.

In wet soil. May-August. Cleveland County.

VI. SPERMOLEPIS Raf.

Annual herbs, with erect, slender, branching stems. Leaves alternate, dissected into narrow segments. Flowers very small, white, in compound unequal-rayed umbels. Involucre none. Involucels of a few, small, narrow bracts. Calyx-teeth obsolete. Fruit ovate, laterally flattened, tuberculate or bristly. Oil-tubes solitary in the intervals, 2 on the commissural side. Stylopodium short, conic.

Umbel-rays divaricate.

1. *S. divaricatus*.

Umbel-rays ascending.

2. *S. patens*.

1. **Spermolepis divaricatus** (Walt.) Britton. ROUGH-FRUITED SPERMOLEPIS. Very slender and widely branching. Rays of the umbels almost filiform, divaricate. Flowers about $\frac{1}{2}$ " broad. Pedicels filiform, 3"-6" long. Fruit ovate, densely tuberculate, 6" long.

In sandy soil and on prairies. April-May. Frequent.

2. **Spermolepis patens** (Nutt.) Robinson. SPREADING SPERMOLEPSIS. Erect, slender, 12'-24' high. Stem-leaves short-petioled, bi-ternately dissected into narrowly linear, filiform segments. Umbels terminal, or axillary, 6"-18" broad. Rays 3"-6" long. Pedicels $1\frac{1}{2}$ "-2" long in full fruit. Fruit ovate, slightly more than $\frac{1}{2}$ " long, more or less tuberculate.

Sandy soil, May-June. Frequent.

VII. AMMOSELINUM T. & G.

Annual, caulescent, diffuse herbs. Leaves alternate, ternately dissected. Flowers perfect in compound umbels. Involucres and involucels of several entire or dissected bracts. Disk with a short, conic stylopodium. Fruit longer than broad. Carpels terete or slightly laterally flattened, with 5 prominent ribs which are tuberculate or spiny. Oil-tubes solitary in the intervals and 2 in the inner side.

1. **Ammoselinum Popei** T. & G. POPE'S SAND-PARSLEY. Diffuse, 6'-15' high, rough. Lower leaves slender-petioled, the upper sessile, all dissected into linear segments about $\frac{1}{2}$ " wide. Fruit ovate, 2"-2 $\frac{1}{2}$ " long, narrowed above, 1" wide or a little more, the ribs rather strongly tuberculate.

In sandy soil. April-May. Oklahoma County.

VIII. PTILIMNIUM Raf.

Annual, caulescent herbs. Leaves alternate, pinnately, or ternately dissected into narrow or filiform segments, and compound umbels of white flowers. Involucres and involucels of several slender, often dissected, bracts. Styl-opodium conic. Fruit slightly flattened, glabrous. Carpels dorsally compressed, the dorsal and intermediate ribs prominent, slender, the lateral ones very thick and corky. Oil-tubes solitary in the intervals. Seed-face flat.

1. **Ptilimnium Nuttallii** (DC) Britton. NUTTALL'S MOCK BISHOP WEED. Stem erect or ascending, 24'-36' high, branching above. Leaf-blades finely dissected, the segments filiform. Fruit nearly orbicular, $\frac{1}{2}$ " long.

In swamps. May-September. Central part of state.

FAMILY 64. CORNACEÆ. DOGWOOD FAMILY.

Shrubs or trees, rarely herbs. Leaves opposite or alternate, without stipules. Flowers small, actinomorphic, variously clustered. Limb of the calyx epigynous, very short. Petals 4-5, borne on the margin of a disk on top of the ovary. Stamens 4-5, inserted with the petals. Ovary 1-4-celled, with one ovule in each cell. Style 1. Fruit a 1-2-celled and 1-2-seeded drupe.

Flowers perfect, 4-parted; ovary 2-celled.

I. Cornus.

Flowers polygamous or diœcious; petals minute or none; ovary 1-celled.

II. Nyssa.**I. CORNUS (Tourn.) L.**

Shrubs or trees, with simple, mostly entire, opposite, verticillate or, rarely, alternate leaves, and small, white, greenish, or purple flowers, in cymes. Calyx-tube top-shaped or campanulate, its limb minutely 4-toothed. Petals 4, valvate. Stamens 4. Ovary 2-celled. Stigma truncate or capitate. Drupe ovoid or globular, the stone 2-celled and 2-seeded.

1. *Cornus asperifolia* Michx. ROUGH-LEAVED DOGWOOD. A shrub with reddish-brown twigs, the youngest rough-pubescent. Leaves slender-petioled, ovate-oval, or elliptic, acuminate at the apex, obtuse at the base, pale and woolly pubescent beneath, densely rough pubescent above, 1½'-5' long. Cyme loose, 2'-3' broad. Petals white. Fruit globose, white, about 3" in diameter.

Along streams. May-June. Common.

II. NYSSA L.

Trees or shrubs, with alternate-petioled, entire or dentate leaves. Flowers small, greenish, polygamo-diœcious, in capitate clusters, short racemes or the fertile ones sometimes solitary. Staminate flowers numerous, the calyx small, 5-parted, the petals minute and fleshy. Stamens 5-15. Disk entire or lobed. Pistillate flowers 2-14,

or solitary, bracted. Calyx-limb 5-toothed, or truncate. Ovary 1-celled, with 1 pendulous ovule. Drupe ovoid or oval, the stone bony, compressed, ridged or terete, 1-seeded.

1. *Nyssa sylvatica* Marsh. SOUR GUM. A large tree with rough bark. Leaves ovate or oval, acute, acuminate, or obtuse at the apex, usually narrowed at the base, entire, glabrous and shining above, more or less pubescent beneath, 2'-4' long. Staminate flowers in compound capitate clusters. Fruit ovoid, nearly black, 4"-7" long, acid.

In rich, moist soil. April-June. Eastern part of state.

FAMILY 65. PRIMULACEÆ. PRIMROSE FAMILY.

Herbs, with simple leaves, often most or all of them basal. Flowers bi-sexual and actinomorphic, generally gamopetalous. Stamens commonly 5, inserted on the corolla, opposite its lobes. Pistil consisting of a single stigma and style and a (generally free) 1-celled ovary, with a free central placenta.

Lobes or segments of the corolla erect or spreading, not reflexed.

Ovary wholly superior.

I. Androsace.

Ovary adnate to the calyx.

II. Samolus.

Segments of the corolla reflexed; plants scapose.

III. Dodecatheon.

I. ANDROSACE (Tourn.) L.

Low, annual or perennial herbs, scapose, with tufted, small, basal leaves, and terminal, umbellate, or solitary involucrate small, white, or pink flowers. Calyx 5-lobed, cleft or parted. Corolla salver-form or funnel-form, the tube short, not longer than the calyx. Stamens 5, inserted on the tube of the corolla. Ovary superior, turbinate or globose. Stigma capitellate. Capsule turbinate, ovoid or globose, 5-valved, few-many-seeded.

1. **Androsace occidentalis** Pursh. ANDROSACE. Smooth annual. Scapes diffuse, 1'-3' long. Leaves oblong or spatulate, entire, sessile. Calyx-tube obpyramidal in fruit. Corolla very small, white, shorter than the calyx.

In dry soil. April-May. Common.

II. SAMOLUS (Tourn.) L.

Annual or perennial, glabrous herbs, with alternate, entire leaves, or the basal ones rosulate. Flowers small, white, in terminal racemes or panicles. Calyx-tube adnate to the ovary below, its limb 5-cleft. Corolla perigynous, sub-campanulate, 5-lobed or 5-parted. Stamens 5, inserted on the corolla, opposite its lobes, alternating with as many staminodia. Ovary partly inferior. Capsule globose or ovoid, 5-valved from the summit. Seeds minute.

Racemes sessile or nearly so; staminodia at the sinuses of the corolla.

1. *S. floribundus*.

Racemes long-peduncled; staminodia wanting.

2. *S. ebracteatus*.

1. **Samolus floribundus** H. B. K. WATER PIMPERNEL. Erect, branched, 6'-18' high. Leaves membranous, 1'-3' long, obovate, the basal often in a rosulate tuft. Flowers less than a line broad, in paniced racemes. Pedicel filiform, bracteolate near the middle. Capsule 1"-1½" in diameter.

In swamps and brooks. May-September. Payne, Lincoln and Cleveland counties.

2. **Samolus ebracteatus** H. B. K. Stems solitary or tufted, often branched. Leaves alternate, spatulate or obovate, sessile or with short winged petioles. Flowers in racemes. Calyx campanulate. Corolla pink, 3"-4" broad, densely glandular at the base. Capsule sub-globose, about 2" in diameter.

In saline soil along the Cimarron. May-September.

III. DODECATHEON L.

Glabrous, scapose, perennial herbs, with entire or repand basal leaves. Flowers involucrate umbels terminating scapes. Calyx deeply 5-lobed. Corolla 5-parted, the lobes reflexed. Stamens 5, inserted on the throat of the corolla. Filaments monadelphous, connivent into a cone,

exserted. Ovary ovoid or sub-globose, superior. Capsule oblong or cylindric, erect. Seeds numerous, minute. The testa punctate.

1. *Dodecatheon Meadia* L. SHOOTING STAR. AMERICAN COWSLIP. Perennial by a stout rootstock. Scape erect, 8'-24' high. Leaves oblong to ovate or oblanceolate, narrowed into margined petioles or subcordate, entire or toothed. Flowers few in umbels, 9"-15" long. Pedicels re-curved in flower, erect in fruit, unequal. Corolla purple, pink or white. Capsule narrowly ovoid.

On moist cliffs and prairies. April-May. Cleveland and Murray counties.

FAMILY 66. EBENACEÆ. EBONY FAMILY.

Trees or shrubs with alternate, entire, ex-stipulate leaves, and diœcious, polygamous, or, rarely, perfect, regular flowers, solitary or cymose in the axils. Calyx inferior, 3-7-lobed, commonly accrescent and persistent. Corolla gamopetalous, deciduous, 3-7-lobed, the lobes usually convolute in the bud. Stamens 2-4 times as many as the divisions of the corolla. Ovary 3-12-celled. Ovules 1 or 2 in each cell. Fruit a berry.

I. *DIOSPYROS* L.

Trees or shrubs, with broad leaves and lateral cymose, racemose, or solitary flowers, the pistillate commonly solitary, the staminate usually clustered. Calyx 4-6-cleft, enlarging in fruit. Corolla urceolate, 4-6-lobed. Stamens 8-20 in the sterile flowers. Styles 2-6 in the pistillate flowers. Ovary globose or ovoid. Berry large, pulpy. Seeds 4-12, flat, oblong.

1. *Diospyros virginiana* L. PERSIMMON. Usually a small tree. Leaves ovate or oval, entire. Flowers diœcious, mostly 4-parted. Corolla greenish-yellow. Fruit globose, 1' or more in diameter, reddish-yellow and sweet when ripe, astringent when green, ripening after frost.

In fields and woods. May-June. Common.

FAMILY 67. OLEACEÆ. OLIVE FAMILY.

Shrubs or trees. Leaves opposite, simple or odd-pinnate, without stipules. Flowers usually in forking cymes, small, white, greenish or yellow, bi-sexual or uni-sexual. Calyx free from the ovary, 4-lobed or wanting. Corolla hypogynous, regular, 4-parted or of 4 separate petals, sometimes wanting. Stamens 2, borne on the petals or hypogynous. Ovary 2-celled. Fruit 1-2-celled, each cell 1-seeded, rarely 2-seeded.

Fruit a loculicidal capsule; leaves simple; flowers complete.

I. Syringa.

Fruit a samara; leaves pinnate; flowers diœcious or polygamous.

II. Fraxinus.

Fruit a drupe or berry; leaves simple.

III. Forestiera.**I. SYRINGA L.**

Shrubs, with much-branched stems. Leaves opposite, entire. Flowers gamopetalous, in dense, terminal panicles or thyrses. Calyx-lobes unequal. Corolla white or purple, tube cylindric, lobes 4. Ovary 2-celled. Styles united, elongated. Stigma 2-cleft. Ovules 2 in each cavity, pendulous. Capsule coriaceous, narrowly oblong, somewhat compressed. Seeds pendulous, compressed, obliquely winged.

1. *Syringia vulgaris* L. LILAC. A strong-growing hardy shrub. Leaves ovate, somewhat heart-shaped. Flowers sweet-scented, in very close, large clusters, lilac or white. Corolla lobes concave. Cultivated.

II. FRAXINUS (Tourn.) L.

Trees, with opposite and odd-pinnate leaves, and small, diœcious or polygamous, greenish-fasciculate or racemose-fasciculate flowers. Calyx small, 4-cleft, irregular-

ly-toothed, entire or none. Petals none or 2-4, separate, or united in pairs at the base. Stamens 2, inserted on the base of the petals or hypogynous. Ovules 2 in each cavity of the ovary, pendulous. Stigma 2-cleft. Fruit a flat samara, winged at the apex only or all around. Seed oblong.

Body of the samara terete or nearly so, the wing chiefly terminal.

Wing almost entirely terminal; leaves pale beneath.

1. *F. americana*.

Wing manifestly extending down on the sides of the body.

2. *F. pennsylvanica*.

Body of the samara flat, the wing extending all around it.

Twigs terete; leaflets 5-7; samara elliptic or spatulate.

3. *F. caroliniana*.

Twigs 4-sided; leaflets 7-11; samara oblong or cuneate.

4. *F. quadrangulata*.

1. **Fraxinus americana** L. WHITE ASH. A large tree. Twigs and petioles smooth. Leaflets usually 7, ovate or ovate-lanceolate, taper-pointed at the apex, rounded or obtuse at the base, entire or slightly serrate, smooth above, often downy beneath, short-stalked. Flowers mostly diœcious. Key $1\frac{1}{2}$ '-2' long, winged only at the apex. Wing spatulate or oblanceolate.

In rich woods. April-June. Common.

2. **Fraxinus pennsylvanica** Marsh. RED ASH. A small tree with rough, dark gray bark. Twigs and petioles densely velvety-downy. Leaflets 5-9, oblong-ovate or ovate-lanceolate, taper-pointed at the apex, narrowed into a short stalk at the base, finely serrate, smooth above, velvety downy beneath. Key 1'-2' long, the wing somewhat extended along the sides.

Moist soil. Comanche County. April-May.

3. **Fraxinus caroliniana** Mill. WATER ASH. A small tree. Twigs smooth or downy. Leaflets 5-7, ovate or elliptical, acute at the apex, acute or obtuse at the base, entire or slightly serrate, smooth or slightly downy. Flowers diœcious. Key often 3-angled or 3-winged, wings running nearly to the base, oblong or oval and pinnately veined.

In swamps and wet soil. March-April.

4. **Fraxinus quadrangulata** Michx. BLUE ASH. A large forest tree with 4-sided twigs, the foliage glabrous, or sparingly pubescent when young. Leaflets 7-11, ovate, oblong, or lanceolate, acuminate

at the apex, rounded or narrowed at the base, sharply serrate. Key linear-oblong or cuneate, 1'-2' long, winged all around, parallel-veined.

In woods. March-April.

III. FORESTIERA Poir.

Shrubs with opposite, simple, serrulate or entire, deciduous or persistent leaves, and small, yellow or greenish dioecious or polygamous flowers, fascicled, short-racemose or paniculate from scaly buds produced at the axils of the preceding season. Calyx wanting. Corolla wanting, or of 1 or 2 small, deciduous petals. Stamens 2-4. Ovary ovoid, 2-celled. Stigma 2-lobed. Fruit an oblong or sub-globose drupe.

1. *Forestiera acuminata* (Michx.) Poir. *ADELIA*. A shrub or small tree, the branches somewhat spiny, the foliage glabrous. Leaves ovate, lanceolate or oblong, finely denticulate, 1'-4' long. Staminate flowers fascicled. Pistilate flowers short-paniculate. Drupe oblong when mature.

River banks. March-April. Southeastern part of state.

FAMILY 68. LOGANIACEÆ. LOGANIA FAMILY.

Herbs, shrubs or vines, with opposite or verticillate, simple, stipulate leaves, or the leaf-bases connected by a stipular line or membrane, and regular, perfect, 4-5-parted, mostly cymose or spicate flowers. Calyx inferior, the tube campanulate. Corolla gamopetalous, funnel-form, campanulate, or, rarely, rotate. Ovary superior, 2-celled (rarely 3-5-celled.) Fruit a 2-valved capsule. Seeds winged or wingless.

I. POLYPREMUM L.

A glabrous, diffusely-branched, annual herb, with opposite, linear-subulate leaves, their bases connected by a stipular membrane, and small, white flowers in terminal, bracted cymes. Calyx deeply 4-parted. Corolla rotate-

campanulate, bearded in the throat. Stamens 4, inserted on the corolla. Stigma capitate or obscurely 2-lobed. Capsule globose-ovoid, slightly compressed, didymous. Seeds smooth.

1. Polypremum procumbens L. POLYPREMUM. Stems tufted, 4-angled, usually much-branched, 2'-12' long. Leaves narrowly linear, $\frac{1}{2}$ '-1 $\frac{1}{2}$ ' long, $\frac{1}{2}$ "-1" wide, sessile, minutely rough-toothed on the margins. Flowers solitary, sessile in the forks of the cymes and along their branches, leafy-bracted. Capsule crustaceous, about 1" in diameter.

In dry sandy soil. May-September. Lincoln County.

FAMILY 69. GENTIANACEÆ. GENTIAN FAMILY.

Annual or perennial herbs. Leaves entire, usually opposite, sometimes alternate, without stipules. Flowers actinomorphic, solitary or in cymes. Calyx hypogynous, 4-8-toothed or lobed. Corolla hypogynous, wheel, bell, or funnel-shaped, 4-8-lobed. Stamens 4-8, inserted on the corolla tube. Ovary 1-2-celled. Ovules many, on 2 opposite placentas. Capsule 1-celled or partially 2-celled, 2-valved, many-seeded.

I. EUSTOMA Salisb.

Glaucous, annual herbs, with opposite, sessile or clasping, entire leaves. Flowers large, blue, purple, or white, long-peduncled, axillary and terminal, solitary or paniculate. Calyx deeply 5-6-cleft, keeled. Corolla broadly campanulate, deeply 5-6-lobed, the lobes oblong or obovate, usually erose-denticulate, stamens 5-6, inserted on the throat of the corolla. Ovary 1-celled. Stigma 2-lamellate. Capsule oblong or ovoid. Seeds foveolate.

1. Eustoma Russellianum (Hook.) Griseb. RUSSELL'S EUSTOMA. Stem stout, 12'-30' high. Leaves oblong or ovate-oblong, 3-5 nerved, the upper usually acute at the apex, cordate-clasping at the base, 1 $\frac{1}{2}$ '-3' long, the lower obtuse at the apex and narrowed into a sessile or auricled base. Flowers 2'-3' broad. Calyx-lobes long, acu-

minate, shorter than the purple corolla. Corolla lobes obovate, about 4 times as long as the tube. Capsule oblong, pointed.

On prairies. May-August. Kingfisher, Cleveland and Grady counties.

FAMILY 70. APOCYNACEÆ. DOGBANE FAMILY.

Perennial herbs, shrubs or vines, mostly with an acrid, milky juice, with simple, opposite, alternate or verticillate, ex-stipulate leaves, and perfect, regular, 5-parted, cymose, solitary or paniculate flowers. Calyx inferior, persistent. Corolla gamopetalous, its lobes convolute in the bud. Ovary superior, or its base adherent to the calyx. Fruit usually of 2 follicles or drupes.

Leaves alternate; erect herbs.

I. *Amsonia*.

Leaves opposite; vines or herbs.

II. *Apocynum*.

I. AMSONIA Walt

Perennial herbs. Leaves alternate, entire. Flowers blue or bluish, in terminal, thyrsoïd or corymbose cymes. Calyx 5-parted, acuminate. Corolla mostly salver-form, the tube dilated at the summit, villous within. Stamens inserted on the throat of the corolla, included. Disk none. Carpels 2, connected by the slender styles. Stigma appendaged by a reflexed membrane. Follicles 2 together.

1. *Amsonia Amsonia* (L.) Britton. AMSONIA. Loosely pubescent or hairy when young, soon glabrous. Leaves from ovate-lanceolate to linear-lanceolate, taper-pointed. Calyx lobes about 1" long. Tube of the bluish corolla little longer than the lobes. Follicles 2'-4' long, about 2" thick.

In moist soil. April-July. Comanche County.

II. APOCYNUM L.

Perennial, branching herbs, with opposite, entire leaves, and small, white or pink flowers in terminal and sometimes axillary corymbed cymes. Calyx 5-parted, acute. Corolla urceolate to campanulate, the tube bear-

ing within 5 small appendages alternate with the stamens, 5-lobed. Stamens inserted on the base of the corolla. Disk 5-lobed. Carpels 2. Stigma ovoid, obtuse. Follicles slender, elongated, terete. Seeds small, tipped with a long coma.

Leaves and cymes glabrous, or sparingly pubescent.

1. *A. cannabinum*.

Leaves, cymes, and often the whole plant densely pubescent.

2. *A. pubescens*.

1. **Apocynum cannabinum** L. INDIA HEMP. Stem extensively branched, glabrous or nearly so. Leaves oblong, lanceolate-oblong or ovate-oblong, acute or obtuse, and mucronate at the apex, narrowed or rounded at the base, glabrous above, sometimes pubescent beneath, 2'-6' long. Cymes dense. Corolla greenish-white. Follicles 4' long.

In fields and thickets. May-July. Lincoln and Oklahoma counties.

2. **Apocynum pubescens** R. Br. VELVET DOGBANE. Whole plant densely velvety-pubescent, or the stem sometimes glabrate. Leaves oval to elliptic, strongly mucronate. Petioles 1"-2" long. Cymes dense. Calyx segments about as long as the tube of the corolla. Follicles about 4' long.

In dry sandy soil. April-August. Payne County.

FAMILY 71. ASCLEPIADACEÆ. MILKWEED FAMILY.

Shrubs or herbs, often twining. Juice usually milky. Leaves generally opposite or whorled, entire, without stipules. Flowers regular. Calyx 5-parted. Corolla 5-parted. Stamens 5. Filaments usually united around the styles. Often with hook-like appendages, each with an incurved horn borne on the stamen tube and forming a crown around the stigma. Ovary free from the calyx tube, of 2 carpels, more or less united below but unconnected above. Styles 2. Stigmas 5 angled. Ovules several-many. Fruit consisting of 1 or 2 pods.

Corona-hoods each with an incurved horn within;
leaves mostly opposite. 1. *Asclepias*.

Corona-hoods prominently crested within; leaves alternate.
2. *Asclepiodora*.

I. ASCLEPIAS L.

Perennial, erect or decumbent herbs, with opposite, verticillate or, rarely, alternate, entire leaves, and flowers in terminal or axillary umbels. Calyx 5-parted or 5-divided, often glandular within. Corolla deeply 5-parted, reflexed. Corona-column generally present. Corona of 5 concave, erect, or spreading hoods, each bearing within a slender or subulate, incurved horn, either included or exserted. Filaments connate into a tube. Antlers tipped with an inflexed membrane, winged. Stigma nearly flat, 5-angled or 5-lobed. Follicles acuminate.

Leaves ovate, oblong, ovate-lanceolate, obovate or obicular.

Plants glabrous, or minutely pubescent above.

1 *A. amplexicaulis*.

Plants, at least the lower surfaces of the leaves, canescent or tomentose.

2. *A. speciosa*.

Leaves lanceolate, oblong-lanceolate or linear.

Hoods entire.

3. *A. verticillata*.

Hoods dorsally hastate-sagittate.

4. *A. galioides*.

1. ***Asclepias amplexicaulis* J. E. Smith.** BLUNT-LEAVED MILKWEED. Stems glabrous, stout, erect or ascending, 2°-3° long. Leaves sessile, oblong or ovate-oblong, obtuse and mucronate at the apex, cordate-clasping at the base, 3'-5' long, margins wavy-crisped. Umbels many-flowered, usually solitary on the terminal peduncle. Corolla segments greenish-purple, about 4" long. Hoods pink, toothed at the summit, shorter than the incurved horn, longer than the anthers. Follicles erect on the stout, decurved pedicels, downy, 4'-6' long.

In dry fields. May-August. Oklahoma County.

2. ***Asclepias speciosa* Torr.** SHOWY MILKWEED. Plant white-tomentose or canescent all over. Stem simple, stout, 12'-30' high.

Leaves thick, broadly ovate, or oval, 3'-8' long, 2'-4' wide. Umbels several or, rarely, solitary, many-flowered. Corolla purple-green. Hood lanceolate, with two blunt teeth below. Horn short, inflexed. Follicles erect or spreading on the recurved pedicels, 3'-4' long, densely woolly and covered with soft, spinose processes.

In moist soil. May-July. Oklahoma, Kingfisher and Blaine counties.

3. *Asclepias verticillata* L. WHORLED MILKWEED. Stem pubescent in lines above, leafy, 12'-30' tall. Leaves narrowly linear, sessile, verticillate, in 3's-7's or some of them alternate, their margins revolute. Umbels numerous, many-flowered. Corolla greenish white. Hood white, oval, entire, much shorter than the subulate incurved horn. Follicles erect on the erect, fruiting pedicels, narrowly spindle-shaped, glabrous, 2'-3' long.

In dry fields and on hills. May-September. Frequent.

4. *Asclepias galioides* H. B. K. BEDSTRAW MILKWEED. Stem erect, 12' high or more. Leaves erect or spreading, in whorls of 2-6, narrowly linear, its margins revolute. Umbels 9"-13" in diameter. Flowers greenish-white. Hoods as high as the anthers, dorsally hastate-sagittate, entire. Horn arising from the base of the hood. Follicles erect on erect, fruiting pedicels, attenuate, 2'-2¼' long.

Prairies. May-July.

II. ASCLEPIODORA A. Gray

Low and stout perennial herbs, often decumbent. Flowers large. Corolla-lobes ovate, greenish, ascending or spreading. Follicles ovoid, often somewhat muricate, with soft, spinous projections. Hoods destitute of a horn. Otherwise resembling *Asclepias*.

Glabrous or nearly so; leaves oblong to ovate-lanceolate; umbels corymbose. 1. *A. viridis*.

Stem rough-puberulent; leaves lanceolate or linear, acuminate; umbels solitary. 2. *A. decumbens*.

1. *Asclepiodora viridis* (Walt.) A. Gray. OBLONG-LEAVED MILKWEED. Stem erect, nearly smooth, 12'-24' high. Leaves alternate, short-petioled, oblong to ovate-lanceolate. Umbels 2-4. Flowers about 1' in diameter, green with a purplish crown. Follicle ascending, puberulent, 2'-3' long.

In dry soil. May-July. Common.

2. *Asclepiodora decumbens* (Nutt.) A. Gray. DECUMBENT MILKWEED. Stems decumbent or ascending, 10'-24' long. Leaves linear to lanceolate. Umbel solitary, many-flowered. Corolla greenish.

Hoods purple. Follicles nearly erect on the re-curved, fruiting pedicels, 3'-4' long.

In dry soil. April-June. Common.

FAMILY 72. CONVULVULACEÆ. MORNING-GLORY.
FAMILY.

Herbs or shrubs, the stems twining, ascending, trailing or erect. Leaves alternate, entire, dentate, lobed or dissected. Flowers regular, perfect. Sepals 5. Corolla hypogynous, tubular, bell-shaped or funnel-shaped, its limb more or less 5-lobed or angled. Stamens 5, inserted on the corolla tube. Ovary usually 2-4-celled. Style slender, 2-4 cleft. Ovules 1 or 2 in each cell. Capsule 1-4 celled, 2-4 valved, or bursting open across the base.

Style 2-cleft or 2-divided.

I. Evolvulus.

Style entire up to the stigma.

Stigma or stigmas capitate or globose. **II. Ipomoea.**

Stigmas 2, filiform to oblong. **III. Convolvulus.**

I. EVOLVULUS L.

Small, prostrate or diffuse perennials with more or less densely pubescent stems and small, simple, entire leaves. Flowers solitary in the axils. Sepals nearly equal. Corolla funnel-form or nearly rotate, white or blue, the limb entire. Ovary 2-celled. Capsules sub-globose, 2-4-valved.

1. Evolvulus pilosus Nutt. EVOLVULUS. Perennial, deeply silky-pubescent or villous. Stem 3'-9' high. Leaves sessile, oblong, lanceolate or spatulate, 3"-9" long. Flowers solitary and nearly sessile in the axils. Peduncles recurved in fruit. Corolla funnel-form, campanulate, purple or blue, 3"-4" broad. Capsule 1½"-2" in diameter.

On dry plains. May-July. Frequent.

II. IPOMOEA L.

Twining, trailing, or erect, annual or perennial herbs,

mostly with large showy flowers. Sepals usually unequal. Corolla funnel-form to trumpet-shaped, plicate, and generally convolute, the limb from entire to lobed. Stamens included. Style slender, with capitate stigma. Capsule globular, 2-4-celled.

Leaves cordate; stems trailing or twining

1. *I. pandurata*.

Leaves linear; stems ascending or erect.

2. *I. leptophylla*.

1. *Ipomoea pandurata* (L.) Meyer. WILD POTATO VINE. Perennial. Stems trailing or feebly climbing, leaves broadly ovate, cordate, entire. Peduncles 1-5 flowered. Corolla funnel-form, white, or with pinkish-purple stripes in the throat, 2'-3' long. Capsule ovoid, the seeds densely woolly on the margins and pubescent on the sides.

In dry soil. May-September. Along Cimarron River.

2. *Ipomoea leptophylla* Torr. BUSH MORNING GLORY. Perennial from an enormous root. Stems erect, ascending or reclining. Leaves narrowly linear, entire, 2'-5' long. Peduncles 1-4-flowered. Corolla funnel-form, purple or pink, about 3' long. Capsule ovoid.

In dry soil. May-July. Frequent in soil underlaid with sandstone.

III. CONVULVULUS L.

Perennial herbs with trailing, twining or erect stems. Leaves entire, dentate or lobed, mostly cordate or sagittate and petioled. Flowers axillary, solitary, or clustered, large, pink, purple or white. Sepals equal or unequal, often a pair of bracts at their base. Corolla campanulate to funnel-form, plicate, the limb entire or lobed. Stamens inserted on the tube, included. Stigmas two, filiform or oblong. Capsule globose, usually 2-celled.

Calyx with two large bracts at the base, which enclose it.

Stems trailing or climbing.

1. *C. repens*.

Stem erect or ascending; flowers white; bracts not cordate.

2. *C. spithameus*.

Calyx not bracted; peduncle bracted at the summit.

Glabrous or nearly so; leaves entire, auriculate.

3. *C. arvensis*.

Canescent; leaves with 2-4 basal lobes. 4. *C. incanus*.

1. *Convolvulus repens* L. TRAILING BINDWOOD. Stem trailing or twining. Leaves ovate or oblong, sagittate or cordate at the base, entire 1'-2' long. Peduncles 1-flowered. Flowers white, about 2' long. Calyx bracted.

In moist and dry soil. May-August. Common.

2. *Convolvulus spithameus* L. UPRIGHT BINDWEED. Stem erect or ascending. Leaves oval, subcordate at the base, 1'-2' long. Peduncles 1-flowered. Flowers white, nearly 2' long. Calyx bracted.

In dry, sandy, or rocky fields or on banks. May-August. Frequent.

3. *Convolvulus arvensis* L. SMALL BINDWEED. Stems trailing or decumbent. Leaves ovate or oblong, entire, sagittate or somewhat hastate at the base, 1'-2' long. Peduncles 1-4 flowered, 1-2 bracted at the summit. Corolla pink or nearly white, 8"-12" broad. Calyx not bracted.

In fields and waste places. May-September. Frequent.

4. *Convolvulus incanus* Vahl. HOARY BINDWEED. Finely and densely canescent. Stems procumbent or trailing. Leaves lanceolate, ovate to linear in outline, usually with 2-4 divergent lobes at the base, otherwise entire, or irregularly dentate, 1'-2' long. Peduncles 1-2 flowered, minutely bracted at the summit.

In dry, rocky soil. April-August. Comanche County.

FAMILY 73. POLEMONIACEÆ. PHLOX FAMILY.

Annual or perennial herbs, rarely shrubs. Leaves alternate or the lower opposite, without stipules. Flowers in terminal, forking cymes. Calyx hypogynous, 5-lobed. Corolla regular or nearly so, 5-parted. Stamens 5, inserted on the corolla tube, usually unequal. Ovary 3-celled. Style simple. Stigmas 3, linear. Capsule 3-celled, the cells 1-many-seeded.

Corolla salver-form; leaves opposite, entire. I. Phlox.

Corolla funnel-form, tubular, salver-form, or campanulate; leaves alternate or opposite. II. Gilia.

I. PHLOX. L.

Perennial, or, rarely, annual, erect or diffuse herbs,

with opposite, entire leaves, and large, blue, purple, red, or white flowers in terminal cymes or cymose panicles. Calyx tubular or tubular-campanulate, 5-ribbed, 5-cleft. Corolla salver-form, the tube narrow, the limb 5-lobed. Stamens unequally inserted on the corolla-tube. Ovary oblong or ovoid, 3-celled. Capsule ovoid, 3-valved. Seeds ovoid, wingless or narrowly winged.

1. **Phlox pilosa** L. DOWNY PHLOX. Soft, downy, or hairy, often glandular. Stem erect or ascending. Leaves linear or lanceolate, 1'-4' long. Cymes corymbose. Flowers short-pedicelled. Calyx glandular-viscid, teeth longer than the tube, bristle-pointed. Corolla pink, purple, or white, lobes obovate. Capsule shorter than the calyx.

In dry soil. April-June. Oklahoma, Cleveland, Caddo counties.

II. GILIA R. & P.

Herbs with opposite or alternate, entire, pinnatifid, palmatifid, or dissected leaves. Flowers solitary, cymose, capitate, thyrsoïd, or paniculate. Calyx campanulate or tubular, 5-toothed or 5-cleft. Corolla funnel-form, tubular, campanulate, rotate or salver-form, 5-lobed. Stamens equally or unequally inserted on the corolla. Ovary oblong or ovoid, 3-celled. Capsule ovoid or oblong, 3-celled.

1. **Gilia longiflora** (Torr.) Don. WHITE-FLOWERED GILIA. Annual, glabrous 12'-24' high. Leaves alternate, sessile, 12"-18" long, pinnately divided into linear-filiform segments, or the uppermost entire. Flowers white, paniculate, about 2' long. Corolla salver-form. Stamens unequally inserted. Capsule narrowly oblong.

In dry soil. May-September. Payne County.

FAMILY 74. HYDROPHYLLACEÆ. WATER-LEAF FAMILY.

Herbs, mostly hirsute, pubescent or scabrous, with alternate or basal, rarely opposite, leaves, and perfect, regular 5-parted flowers, in scorpioid cymes, spikes or racemes, or, rarely, solitary. Calyx inferior, deeply cleft, or divided, the sinuses sometimes appendaged. Corolla gamopetalous,

funnel-form, salver-form, campanulate, or rotate. Stamens 5, inserted on the tube or base of the corolla, and alternate with its lobes. Ovary superior, 2-celled, or 1 celled with 2 placentæ. Capsule 1-2 celled.

Styles united below; ovary 1-celled; leaves mostly lobed or dentate.

Corolla-lobes convolute in the bud; placentæ narrow.

Sinuses of the calyx appendaged. 1. *Nemophila*

Calyx much enlarged in fruit, its sinuses not appendaged. 2. *Nyctelea*.

Corolla-lobes imbricated in the bud; placentæ narrow.

3. *Phacelia*

Styles distinct to the base; ovary 2-celled; leaves entire. 4. *Nama*.

I. NEMOPHILA Nutt.

Annual, diffuse, pubescent, slender herbs, with alternate or opposite, mostly pinnatifid or lobed leaves. Flowers white, blue, or variegated, solitary, lateral, or terminal. Calyx deeply 5-cleft or 5-parted. Corolla campanulate or rotate-campanulate, usually with 10 small appendages within at the base. Ovary 1-celled. Capsule 2-valved.

1. *Nemophila phacelioides* Nutt. BABY-BLUE-EYES. Foliage hirsute, or glabrate in age. Stems branched at the base, the branches 2'-24' long. Leaves 2'-4' long. Blades pinnately divided, segments usually incised. Calyx bristly. Corolla about 1" broad. Capsules globular, 2"-3" broad.

Prairies. Spring. Caddo County.

II. NYCTELEA Scop.

Annual, hirsute or pubescent, branching herbs with opposite or alternate, pinnately divided or 1-3-pinnatifid leaves, and solitary or racemose, small, white, or bluish

flowers. Calyx 5-lobed or 5-parted, spreading. Corolla campanulate or nearly cylindric, usually with 5 minute appendages on the tube within. Ovary 1-celled. Styles united below.

1. Nyctelea *Nyctelea* (L.) Britton. NYCTELEA. Sparingly hirsute-pubescent. Stem 4'-12' high. Leaves pinnately divided, 2'-4' long, ovate-oblong in outline, the upper alternate, the lower opposite, the segments dentate, entire or lobed. Peduncles 1-flowered, opposite the leaves. Calyx becoming 8"-14" broad in fruit. Capsule globose, 2"-3" in diameter.

In moist soil. April-July. Oklahoma County.

III. PHACELIA Juss.

Annual, biennial or perennial, mostly hirsute or scabrous herbs. Leaves alternate, sometimes simple, but in most species lobed or divided. Flowers in one-sided clusters, often showy. Calyx 5-parted, without appendages. Corolla with 5 spreading lobes. Ovary 1-celled, with narrow placentæ.

Appendages of the corolla tube between the stamens conspicuous.

Stamens longer than the corolla. 1. *P. integrifolia*.

Stamens shorter than the corolla. 2. *P. brevistylis*.

Appendages of the corolla-tube inconspicuous.

3. *P. dubia*.

1. Phacelia integrifolia Torr. CRENATE-LEAVED PHACELIA. Annual or biennial. Stem stout, leafy, viscid-hirsute. 6'-24' high. Leaves finely strigose-pubescent, ovate-oblong or oblong-lanceolate, crenate-dentate. Scorpioid cymes dense, 2'-4' long. Flowers sessile, about 4" long. Corolla tubular-campanulate, white or blue. Capsule ovoid.

In saline soil. April-September.

2. Phacelia brevistylis Buckl. Biennial, softly hirsute below, glandular-pilose above. Stems 5'-16' tall. Leaf-blades pinnately divided, the segments coarsely incised or pinnatifid. Corolla 2"-4" broad. Filaments pubescent. Capsules depressed, about 2" long.

On shaded slopes. April-July.

3. Phacelia dubia (L.) Small. SMALL-FLOWERED PHACELIA. Annual, puberulent or glabrate, branched from the base, the branches

slender, 5'-12' high. Lower leaves petioled, 1'-2' long, pinnatifid or pinnately divided into 3-5 entire or dentate segments, upper leaves much smaller, sessile. Flowers light blue or white, racemose, 4"-5" broad. Capsule globose, 1½" in diameter.

In moist soil. April-June. Oklahoma and Comanche counties.

IV. NAMA L.

Perennial herbs, with alternate, entire leaves, sometimes with spines in their axils. Flowers blue, cymose-clustered, or racemose. Calyx-segments distinct to the base, ovate or lanceolate. Corolla rotate-campanulate, not appendaged within, 5-cleft. Stamens inserted on the base of the corolla. Ovary 2-celled. Stigma capitellate. Capsule globose or ovoid.

1. Nama ovata (Nutt.) Britton. OVATE-LEAVED NAMA. Stem erect, branched near the summit, puberulent or hirsute, usually spine-bearing in the axils. Leaves usually ovate, short petioled, or the upper almost sessile, acute at the apex, narrowed or rounded at the base. Flowers often 1' broad or more, in terminal clusters. Corolla purplish or white. Capsules about 2" high, globose-ovoid.

In wet soil. May-September. McCurtain and Bryan counties.

FAMILY 75. BORAGINACEÆ. BORAGE FAMILY.

Annual, biennial or perennial herbs or shrubs. Leaves alternate, very rarely opposite or verticillate, exstipulate, mostly entire and hispid, pubescent, scabrous or setose. Flowers perfect, usually regular, mostly blue, in one-sided scorpioid spikes, racemes, cymes, or sometimes scattered. Calyx inferior, mostly 5-lobed, 5-cleft, 5-parted, its lobes valvate. Corolla gamopetalous, mostly regular and 5-lobed, sometimes crested or appendaged in the throat. Stamens as many as the corolla-lobes and alternate with them, inserted on the tube or throat. Ovary superior, of 2-ovuled carpels, entire. Fruit mostly of 4 1-seeded nutlets, or 2 2-seeded carpels.

Ovary entire or 2-4-grooved; style terminal.

I. Heliotropium.

Ovary 4 divided or deeply 4-lobed, the style arising from the center.

Corolla salver-form or funnel-form, its lobes rounded, spreading.

Racemes not bracted; corolla-tube short.

II. *Myosotis*.

Racemes bracted; corolla-tube cylindric, usually slender.

III. *Lithospermum*.

Corolla tubular, its lobes erect, acute.

IV. *Onosmodium*.

I. *HELIOTROPIUM* (Tourn.) L.

Herbs or shrubs, with alternate, mostly entire, and petioled leaves. Flowers small, blue, or white, in scorpioid spikes, or scattered. Calyx 5-parted. Corolla salver-form or funnel-form, the throat open. Stigma conic or annular. Fruit 2-4 lobed, separating into 4 1-seeded nutlets, or into two 2-seeded carpels. Ovary entire, or 2-4-grooved.

Flowers in scorpioid spikes. I. *H. curassavicum*.

Flowers solitary, terminating short branches.

II. *H. tenellum*.

1. *Heliotropium curassavicum* L. SEA-SIDE HELIOTROPE. Annual, glabrous, diffuse, the branches 6'-18' long. Leaves linear, or linear-oblong, entire. 1'-2' long. Scorpioid spikes densely-flowered, mostly in pairs. Flowers about 2" broad. Corolla white with yellow eye or changing to blue.

Saline soil. May-September. Along Cimarron River.

2. *Heliotropium tenellum* (Nutt.) Torr. SLENDER HELIOTROPE. Annual, strigose-canescens. Stem erect, slender, leafless below, 6'-18' tall. Leaves linear, entire, 6"-18" long. Flowers white, about 2½" long. Fruit depressed, 4-lobed, separating into 4 1-seeded nutlets.

In dry soil. April-August. McClain County.

II. *MYOSOTIS* (Dill.) L.

Low, annual, biennial, or perennial, pubescent, branch-

ing, diffuse or erect herbs. Leaves alternate, entire. Flowers small, blue, pink, or white, in 1-sided racemes. Calyx 5-cleft, the lobes spreading or erect in fruit. Corolla salver-form, the limb 5-lobed, the throat crested. Stamens 5, inserted on the corolla-tube. Ovary 4-divided. Nutlets erect, glabrous or pilose, attached by their bases to the receptacles.

1. **Mysostis virginica** (L.) B. S. P. SPRING or EARLY SCORPION-GRASS. Annual or biennial, bristly-hirsute. Stem erect, 3'-15' high. Leaves oblong or linear-oblong, 3"-12" long. Corolla white, the limb 1½" broad.

On dry hills. April-June. Common.

III. LITHOSPERMUM (Tourn.) L.

Annual or perennial, erect, branching, pubescent, hirsute or hispid herbs. Leaves alternate, entire. Flowers small or large, white, yellow, or blue in leafy-bracted spikes or racemes. Calyx 5-parted or 5-cleft. Corolla funnel-form or salver-form, 5-lobed, naked, pubescent or crested in the throat, the lobes entire or erose-denticulate. Stamens 5, inserted on the throat of the corolla. Ovary 4-divided. Stigma capitate, or 2-lobed. Nutlets 4, erect, white, smooth and shining, or brown and wrinkled, attached by their bases.

Annual plants, corolla white or whitish. 1. *L. arvense*.

Perennial plants, corolla yellow.

Corolla lobes entire; all flowers complete.

Stems hirsute; corolla tube beardless at the base within. 2. *L. canescens*.

Stems hispid; corolla tube bearded at the base within. 3. *L. Gmelini*.

Corolla-lobes erose or laciniate; later flowers cleistogamous. 4. *L. linearolium*.

1. **Lithospermum arvense** L. CORN GROMWELL. Annual or biennial, hoary-strigose. Leaves narrowly lanceolate. Flowers inconspicuous, whitish, in the upper axils. Corolla pubescent in the throat, but not crested, tube funnel-form. Nutlets ovoid, pitted and wrinkled.

In waste places and fields. April-August. Oklahoma County.

2. *Lithospermum canescens* (Michx.) Lehm. HOARY PUCCOON. Perennial, somewhat canescent when young. Leaves oblong, entire. Corolla orange-yellow, appendaged, not woolly within. Tube funnel-form, prominently crested in the throat. Nutlets ovoid, lustrous, keeled.

In dry soil. April-June. Frequent.

3. *Lithospermum Gmelini* (Michx.) Hitch. HAIRY PUCCOON. Perennial, hirsute or hispid. Leaves linear to lanceolate or oblong, lower reduced to scales, entire. Corolla deep orange-yellow, with appendages in the throat and woolly within. Nutlets ovoid, lustrous.

In dry soil and woods. April-June. Kingfisher and Oklahoma counties.

4. *Lithospermum linearifolium* Goldie. NARROW-LEAVED PUCCOON. Perennial, strigose-pubescent. Leaves linear. Flowers of two kinds in terminal, leafy racemes. Corolla of the earlier ones salver-form, bright yellow, throat crested, the base of the tube not bearded within. Later flowers smaller, pale yellow, cleistogamous. Nutlets white, shining, ovoid, pitted, keeled on the inner side.

In dry soil. April-July. Frequent.

IV. *ONOSMODIUM* Michx.

Perennial, stout, hispid or hirsute, branching herbs. Leaves alternate-entire, strongly veined. Flowers yellowish or greenish-white, proterogynous, in leafy-bracted, scorpioid spikes or racemes. Calyx deeply 5-parted. Corolla tubular or tubular-funnel-form, 5-lobed, throat not appendaged, the sinuses slightly inflexed, the tube with a glandular, 10-lobed band within at the base. Stamens 5, inserted on the tube. Ovary 4-parted. Nutlets 4, ovoid, sometimes sparingly pitted, shining, smooth, white, attached by the base.

Nutlets not constricted.

1. *O. occidentale*

Nutlets distinctly constricted just above the base.

2. *O. hispidissimum*.

1. *Onosmodium occidentale* Mackenzie. WESTERN FALSE GROMWELL. Stem strigose or hirsute-pubescent. Leaves lanceolate to ovate-lanceolate, strongly veined. Corolla 6"-10" long, canescent all over outside. Nutlets ovoid, dull, not constricted at the base.

On prairies and plains. May-July. Oklahoma County.

2. *Onosmodium hispidissimum* Mackenzie. SHAGGY FALSE GROMWELL. Spreading-hirsute with rough, bristly hairs. Leaves lanceolate, ovate-lanceolate or oblong, 5-9 ribbed. Flowers very numerous

and crowded. Corolla yellowish-white, pubescent outside, 5"-9" long. Nutlets obtuse, distinctly constricted at the base.

In dry fields and thickets or on banks. May-July. Logan County.

FAMILY 76. VERBENACEÆ. VERVAIN FAMILY.

Herbs, shrubs, or trees. Leaves opposite or whorled, without stipules. Flowers zygomorphic, in bracted cymes. Calyx hypogynous, cleft or toothed. Corolla hypogynous, tubular, usually more or less 2-lipped. Stamens usually 4 (2 long and 2 short), inserted on the corolla tube. Ovary usually 2-4-celled, with the style springing from its summit.

Corolla-limb 5-lobed, regular or nearly so; nutlets 4.

1. *Verbena*

Corolla-limb 4-lobed, 2-lipped; nutlets 2. II. *Lippia*.

I. VERBENA (Tourn.) L.

Annual or perennial herbs. Leaves opposite. Flowers bracted, variously colored, in terminal, solitary, corymbed or paniced spikes. Calyx usually tubular, 5-angled, more or less unequally 5-toothed. Corolla salver-form or funnel-form, the tube straight or somewhat curved, the limb spreading, 5-lobed. Stamens 4, didynamous, the connective sometimes with a gland. Ovary 4-celled. The stigma 2-lobed. Fruit of 4 nutlets separating at maturity.

Anthers not appendaged.

Spikes very slender and much interrupted at maturity.

1. *V. xutha*.

Spikes stout, continuous by the imbricated or contiguous fruits or if interrupted below, bract as long as the calyx or surpassing it. 2. *V. bracteosa*.

Anthers of the longer stamens appendaged by a gland on the connective.

Corolla tube about $\frac{1}{2}$ longer than the calyx, the limb 4"-5" wide. 3. *V. bipinnatifida*.

Corolla tube about twice as long as the calyx, the limb 5"-8" wide.

4. *V. canadensis*.

1. *Verbena xutha*. Lehm. Perennial or annual, pubescent. Leaves incised-pinnatifid, or 3-parted on the lower part of the stem, strigose to canescent, the segments coarsely-toothed to laciniate. Spikes rather slender, strict. Calyx becoming 2" long, strigose. Corolla blue to purple, its tube shorter than the calyx, limb about 2" broad. Nutlets narrowly oblong.

On open places. May-September. Payne County.

2. *Verbena bracteosa* Michx. LARGE-BRACTED VERVAIN. Perennial, hirsute pubescent. Stem decumbent or ascending. Leaves ovate or oval in outline, pinnately incised or pinnatifid, the lobes mostly dentate. Spikes sessile, dense. Bracts linear-lanceolate, longer than the flowers and fruits, the lobed ones often incised. Corolla purplish-blue, about 2" long.

On prairies and waste places. May-August. Frequent.

3. *Verbena bipinnatifida* Nutt. SMALL-FLOWERED VERBENA. Perennial, producing suckers, hirsute or hispid. Stems erect, 6'-18' high. Leaves firm, deeply 1-2-pinnatifid into linear or linear-oblong lobes. Spikes solitary at the ends of the branches, dense. Bracts linear-subulate, about as long as or somewhat exceeding the calyx. Corolla 6"-9" long, purple or lilac, the limb 4"-7" broad. Nutlets prominently wrinkled above.

On dry plains and prairies. April-September. Frequent.

4. *Verbena canadensis* (L.) Britton. LARGE-FLOWERED VERBENA. Perennial. Pubescent or glabrate. Stem slender, ascending. Leaves membranous, ovate in outline, irregularly-toothed, or pinnately-incised, often 2-cleft, the lobes dentate. Spikes solitary at the end of the branches, dense. Bracts linear-subulate, mostly shorter than the calyx. Corolla 10"-12" long, blue, purple, or white. Nutlets wrinkled all over.

In dry soil. May-August. Frequent.

II. LIPPIA Houst.

Perennial herbs or shrubs. Leaves opposite, sometimes verticillate. Flowers bracted, in axillary or terminal, mostly peduncled, spikes or heads. Calyx membranous, ovoid, campanulate or compressed, and 2-winged, 2-4-toothed or 2-4-cleft. Corolla-tube straight or incurved, cylindric, somewhat 2-lipped, 4-cleft. Stamens 4, didynamous. Ovary 2-celled. Stigma oblique or recurved. Fruit dry, at length separating into 4 nutlets.

Leaves linear-cuneate to spatulate, 2-8-toothed; peduncles little exceeding leaves. 1. *L. cuneifolia*.

Leaves sharply serrate; peduncles much longer than leaves. 2. *L. nodiflora*.

1. ***Lippia cuneifolia*** (Torr.) Steud. WEDGE-LEAVED FOG-FRUIT. Minutely puberulent, with forked hairs or glabrous. Branches procumbent, somewhat zigzag, with short, erect branchlets at the nodes. Leaves linear-cuneate, sessile with 2-8 sharp teeth above the middle. Head globose to cylindric. Bracts cuneate. Fruit oblong.

On plains. May-August. Frequent in central part of state.

2. ***Lippia nodiflora*** (L.) Michx. SPATULATE-LEAVED FOG-FRUIT. Densely puberulent, with short, appressed hairs, creeping. Leaves spatulate, oblanceolate or obovate, sharply serrate above the middle. Heads at length cylindric. Corolla purple to white.

In wet or moist soil. May-September. Frequent.

FAMILY 77. LABIATÆ. MINT FAMILY.

Mostly herbs, with square stems and opposite, more or less aromatic, leaves without stipules. Flowers generally in cyme-like, axillary clusters, which are often grouped into terminal spikes or racemes. Calyx tubular, usually 2-lipped, persistent. Corolla usually 2-lipped. Stamens 4 (2 long and 2 short) or only 2. Ovary free, with 4 deep lobes, which surround the base of the style. Fruit consisting of 4 nutlets, ripening inside the base of the calyx.

I. Ovary 4-lobed, the style not basal; nutlets laterally attached. I. **Teucrium.**

II. Ovary 4-parted, the style basal; nutlets basally attached.

A. Calyx with a protuberance on the upper side.

II. **Scutellaria.**

B. Calyx not gibbous on the upper side.

Stamens included.

III. **Marrubium.**

Stamens exserted.

1. Corolla strongly 2-lipped; lips unlike, the upper concave.

- a. Anther-bearing stamens 4.

Posterior (upper) pair of stamens longer than the anterior.

IV. Glecoma.

Posterior pair of stamens shorter than the anterior.

Calyx distinctly 2-lipped, closed in fruit.

V. Prunella.

Calyx 3-10 toothed, not distinctly 2-lipped, open in fruit.

VI. Lamium.

- b. Anther-bearing stamens 2.

Connective of the anther very long, bearing a perfect sac at one end, and a rudimentary one, or none, at the other.

VII. Salvia.

Connective very short, the anther-sacs confluent.

VIII. Monarda.

2. Corolla 2-lipped, or regular; upper lip, when present, flat, or only slightly concave.

IX. Hedeoma.

I. TEUCRIUM (Tourn.) L.

Herbs or shrubs, with dentate, entire, or laciniate leaves, and pink, white, or purplish flowers, in terminal, bracted spikes or heads, or verticillate in the upper axils. Calyx tubular-campanulate, equally or unequally 5-toothed. Corolla-tube short, the limb irregularly 5-lobed. Stamens 4, didynamous. Ovary 4-lobed. Style 2-cleft at the summit. Nutlets obovoid, rugose-reticulated.

1. **Teucrium laciniatum** Torr. CUT-LEAVED GERMANDER. Perennial, 12' high or less, glabrous or nearly so. Leaves 1½' long or less, pinnately parted into 3-7 stiff, linear, entire, toothed or lobed

segments. Flowers solitary in the upper axils. Corolla pale blue or lilac, about 9" long.

On plains. Kingfisher County. May-August.

II. SCUTELLARIA (Rivin.) L.

Annual or perennial herbs, with small, entire or toothed, short-petioled leaves and solitary flowers axillary to foliar leaves or leaf-like bracts. Calyx campanulate, 2-lipped, the lips entire, the upper crested, persistent, slightly accrescent. Corolla blue or violet, with a recurved tube dilated at the throat, the upper lip arched, the lower with two small, lateral lobes and a large, middle one. Stamens 4. Nutlets papillose-tuberculate.

Perennial from a thick woody root. 1. *S. resinosa*.
Fibrous-rooted; perennial by rootstocks or stolons.

2. *S. parvula*.

1. *Scutellaria resinosa* Torr. RESINOUS SKULLCAP. Perennial, minutely pubescent and usually resiniferous, 6'-10' high. Leaves ovate or ovate-oblong, sessile, or the lower short-petioled, entire, 3"-6" long. Flowers solitary in the axils. Corolla white or violet, pubescent, 6"-8" long.

On dry plains. Comanche County. April-July.

2. *Scutellaria parvula* Michx. SMALL SKULLCAP. Perennial by thickened rootstocks, glabrous or pubescent, sometimes glandular, 3'-12' high. Leaves ovate, oval or lanceolate, or the lower nearly orbicular, entire and sessile, or the lower dentate and petioled, 3"-12" long. Flowers solitary in the axils. Corolla 2"-4" long, violet, pubescent.

In sandy soil. April-July. Frequent in central Oklahoma.

III. MARRUBIUM L.

Perennial, downy, or woolly herbs. Whorls of flowers axillary. Flowers small. Bracts leaflike. Calyx tubular, 5-10-toothed, teeth somewhat spiny. Corolla short, upper lip erect, lower spreading, 3-cleft, the middle lobe broadest. Stamens 4, not projecting. Lobes of the stigma short and blunt. Ovary deeply 4-lobed. Nutlets ovoid, smooth.

1. *Marrubium vulgare* L. COMMON HOARHOUND. Stem erect, woolly. Leaves oval, broadly ovate or nearly orbicular, rugose-veined, crenate-dentate, whitish above, woolly beneath. Clusters all

axillary, densely many-flowered. Flowers whitish. Calyx-teeth usually 10, subulate.

In waste places. May-September. Frequent.

IV. GLECOMA L.

Low, diffuse, creeping herbs, with nearly orbicular or reniform, crenate leaves, and blue or violet flowers in small, axillary, verticillate clusters. Calyx oblong-tubular, 15-nerved, not 2-lipped, unequally 5-toothed. Corolla-tube enlarged above, 2-lipped. The upper lip erect, the lower spreading. Stamens 4, didynamous. Ovary deeply 4-parted. Nutlets ovoid, smooth.

1. *Glechoma hederacea* L. GROUND IVY. GILL-OVER-THE-GROUND. Perennial, the creeping stems leafy. Leaves green on both sides, 6"-18" in diameter. Clusters few-flowered, the flowers 7"-10" long. Corolla bluish-purple, corolla tube 3 times as long as the calyx. The upper pair of stamens much longer than the lower.

Waste places and about houses and gardens. March-May. Frequent.

V. PRUNELLA L.

Perennials, with stems simple or nearly so, and sessile, 3-flowered flower clusters in the axils of kidney-shaped bracts, the whole forming a spike or head. Calyx tubular-bell-shaped, somewhat 10-ribbed. Upper lip broad, 3-toothed, the teeth short. Lower lip with two longer teeth. Upper lip of the corolla upright, arched, and entire. The lower spreading, reflexed, fringed, and 3-cleft. Stamens 4, reaching up under the upper lip, with the tips of the filaments 2-toothed, only one tooth anther-bearing. Ovary deeply 4-parted. Nutlets ovoid, smooth.

1. *Prunella vulgaris* L. SELF-HEAL. HEAL-ALL. Stem procumbent, ascending or erect, 2'-24' long. Leaves ovate, oblong or oblong-lanceolate, entire, crenate, dentate or incised, 1'-4' long. Spikes terminal, very dense, 6"-12" long, becoming 2'-4' long in fruit. Corolla violet or purple or sometimes white, 4"-6" long.

In fields, woods and waste places. May-October.

VI. LAMIUM L.

Annual or perennial, hairy herbs. Calyx tubular-bell-

shaped, 5-veined, with 5 awn-pointed teeth of nearly equal length. Corolla with dilated throat, upper lip arched, middle lobe of the lower lip notched, the lateral lobes small, close to the throat of the corolla. Stamens 4, didynamous, ascending under the upper lip of the corolla. Ovary deeply 4-parted. Nutlets smooth or tuberculate.

Upper leaves sessile or clasping. 1. *L. amplexicaule*.

Leaves all petioled. 2. *L. purpureum*.

1. **Lamium amplexicaule** L. HENBIT. Annual or biennial. Leaves roundish, deeply scalloped, the lower ones petioled, the upper sessile and clasping. Corolla purplish or red, 6"-8" long.

In waste and cultivated ground. February-October. Common.

2. **Lamium purpureum** L. RED DEAD NETTLE. Stem 6'-18' high, silky-hairy or nearly smooth, reclining below, branched from the base. Leaves long-petioled, heart-shaped, crenate. Whorls of flowers mostly terminal, crowded. Corolla 6"-9" long, purple, rarely white.

In waste and cultivated ground. April-October. Oklahoma County.

VII. SALVIA (Tourn.) L.

Annual, biennial, or perennial herbs, or sometimes shrubby. Flowers in spikes, racemes, or panicles, usually showy. Calyx tubular or bell-shaped, not bearded in the throat, 2-lipped, the upper lip entire or 3-toothed, the lower 2-cleft. Corolla 2-lipped. The upper lip entire or notched, the lower spreading, 3-lobed, with the middle lobe longer. Stamens 2, short. Ovary deeply 4-parted. Style 2-cleft. Nutlets smooth.

Corolla 10"-15" long, its tube exserted. 1. *S. Pitcheri*.

Corolla 4"-6" long, its tube not exserted.

2. *S. lanceifolia*.

1. **Salvia Pitcheri** Torr. PITCHER'S SAGE. Perennial, 2°-5° high. Leaves linear or linear-oblong, dentate or entire, sessile or short-petioled, 2'-5' long, the uppermost reduced to small bracts. Flower clusters in long, dense, terminal spikes. Calyx densely and finely woolly, its upper lip entire, the lower with 2 ovate, acute teeth. Corolla blue or white, 1' long, lower lip broad, 3-lobed, upper one concave.

On dry plains. May-September. Common.

2. **Salvia lanceifolia** Poir. LANCE-LEAVED SAGE. Annual, puber-

ulent or glabrous. Stem leafy, 6'-18' high. Leaves oblong, oblong-lanceolate, crenulate-dentate or entire. Flowers mostly opposite, but sometimes 3-4 together in the terminal, spike-like racemes. Upper lip of calyx ovate, entire, the lower 2-cleft, the teeth ovate mucronate. Corolla blue, about 4" long, its lower lip narrow, twice as long as the upper.

On plains. May-September. Frequent.

VIII. MONARDA L.

Perennial or annual, erect, aromatic herbs, with dentate or serrate leaves. Flowers white, red, purple, yellowish, or mottled, in dense, capitate clusters, bracteate and bracteolate, the bracts sometimes brightly colored. Calyx tubular, 15-nerved, 5-toothed. Corolla glabrous within, usually puberulent or glandular without, 2-lipped. Anther-bearing stamens 2. Ovary deeply 4-parted. Styles 2-cleft at the apex. Nutlets ovoid, smooth.

Flower-clusters solitary and terminal, or rarely axillary in robust plants. 1. *M. Bradburiana*.

Flower-clusters axillary and terminal.

Calyx-tube merely puberulent, the lobes spreading; bractlets merely ciliate. 2. *M. dispersa*.

Calyx-tube pubescent, the lobes erect or nearly so; bractlets pubescent on the back and copiously ciliate. 3. *M. clinopodioides*.

1. **Monarda Bradburiana** Beck. BRADBURY MONARDA. Perennial, sparingly villous or glabrate. Stem 12'-24' high. Leaves ovate or ovate-lanceolate, serrate, 2'-3½' long. Flower-clusters solitary and terminal. Bracts green or purplish. Calyx narrowed at the throat, teeth long, bristle-pointed. Corolla pink or nearly white, about 1' long, the lower lip commonly purple-spotted.

On dry hills and thickets. May-July. Pontotoc County.

2. **Monarda dispersa** Small. PURPLE LEMON MONARDA. Annual, puberulent. Stem 12'-30' high. Leaves oblong-spatulate or oblanceolate, 1'-4½' long, shallowly serrate. Flower clusters axillary and terminal, usually conspicuous by the broad, abruptly bristle-tipped purple bracts. Corolla pale, usually pink, 11"-13" long.

On plains and prairies and cultivated ground. May-August. Frequent.

3. **Monarda clinopodioides** A. Gray. FALSE BALM. Annual, 12'-24' tall. Leaves oblong to narrowly linear-oblong, 10"-21½' long,

sharply serrate. Bractlets narrowed into a terminal bristle. Calyx tube pubescent, the lobes plumose-ciliate. Corolla 10"-12" long.

On plains and prairies. May-September. Oklahoma County.

IX. HEDEOMA Pers.

Annual or perennial, strongly aromatic and pungent herbs, with entire or crenulate leaves. Flowers blue or purple, in axillary clusters, crowded into terminal leafy-bracted spikes or racemes. Calyx tubular, 13-nerved, villous in the throat, 2-lipped. Corolla 2-lipped, the upper lip erect or 2-lobed, the lower spreading, 3-cleft. Perfect stamens 2. Sterile stamens 2. Ovary deeply 4-parted. Style 2-cleft at summit. Nutlets ovoid, smooth.

Calyx teeth all nearly equal; annual. 1. *H. hispida*.

Teeth of the lower lip nearly twice as long as the upper; perennial. 2. *H. longiflora*.

1. **Hedeoma hispida** Pursh. ROUGH PENNYROYAL. Annual. Stem 3'-8' high, very leafy, and copiously-flowered. Leaves linear, entire, hispid-ciliate, 6"-12" long. Clusters axillary, numerous, crowded, several-flowered. Bracts subulate, very hispid. Corolla about 3" long, bluish-purple. Sterile stamens rudimentary or none.

On dry plains. May-August. Frequent.

2 **Hedeoma longiflora** Rydb. LONG-FLOWERED PENNYROYAL. Perennial from a woody base. Stem 6'-18' high. Leaves oblong or linear-oblong, entire, 5"-10" long, 1°-2½" wide. Clusters axillary, loosely few-flowered. Corolla purple, 4"-6" long. Sterile stamens rudimentary, or none.

Dry soil. April-August. Common in central part of state.

FAMILY 78. SOLANACEÆ. POTATO FAMILY.

Herbs, shrubs or vines, with alternate or rarely opposite, ex-stipulate, entire, dentate, lobed or dissected leaves, and perfect, regular or nearly regular, cymose flowers. Calyx inferior, gamosepalous, mostly 5-lobed. Corolla gamopetalous, rotate, campanulate, funnel-form, salver-form or tubular, mostly 5-lobed. Stamens as many as the lobes of the corolla and alternate with them, in-

sented on the tube. Ovary entire, 2-celled (Rarely 3-5-celled.) Style slender, simple. Fruit a berry or capsule.

Anthers unconnected, destitute of terminal pores, dehiscent.

Fruit calyx bladdery-inflated.

Corolla open-campanulate, yellowish or whitish, often with a dark center; seeds with a thin margin, finely pitted.

I. Physalis.

Corolla flat-rotate, violet or purple; seeds thick, rugose-tuberculate.

II. Quincula.

Fruiting calyx somewhat enlarged, but closely fitted to the fruit, thin, obscurely veiny, open at the mouth.

III. Chamæsaracha.

Anthers connivent or slightly connate, fruiting calyx not enlarged.

IV. Solanum.

I. PHYSALIS L.

Annual or perennial herbs, glabrous or pubescent. Leaves entire or toothed. Flowers axillary, usually solitary. Calyx campanulate, 5-lobed, accrescent and becoming bladder-like in fruit, 5-angled or prominently 10-ribbed. Corolla yellow or whitish, campanulate or funnel-form, often with a darker, brownish or purplish center. Stamens adnate to the base of corolla. Stigma 2-cleft. Seeds numerous, kidney-shaped, flattened, finely pitted.

Annuals with branched, fibrous roots.

1. *P. missouriensis*.

Perennial by thick roots and rootstocks.

2. *P. comata*.

Physalis missouriensis Mack. & Bush. MISSOURI GROUND CHERRY. Annual. Stem spreading, striate or slightly angled, villous, with short hairs. Leaves $\frac{1}{2}$ '- $3\frac{1}{2}$ ' long, ovate, repand or sinuately-dentate. Calyx villous, lobes shorter than the tube. Corolla $1\frac{1}{2}$ "-4" in diameter, yellow. Fruiting calyx 7"-10" long, round-ovoid, nearly filled by the berry, scarcely sunken.

In waste places. May-September. Oklahoma County.

2. Physalis comata Rydb. HILLSIDE GROUND CHERRY. Peren-

nial. Peduncles and upper branches mixed with long, white, flat, jointed hairs. Leaf blade not over 2' long, round-ovate, somewhat repand-dentate, or nearly entire. Corolla greenish-yellow, with brown center, 6"-10" in diameter. Fruiting calyx round-ovoid, somewhat 10 angled.

Hillsides. April-July. Oklahoma County.

II. QUINCULA Raf.

Perennial, low and diffuse, scurfy herb. Leaves from sinuate to pinnatifid, somewhat fleshy. Peduncles commonly in pairs from the axils of the leaves. Flowers perfect, regular, erect. Calyx campanulate, accrescent and becoming bladder-like in fruit, 5-angled, reticulate, with five converging lobes. Corolla flat, rotate, pentagonal in outline, violet or purple. Seeds comparatively few, flattened, kidney-shaped, rugose-tuberculate.

1. *Quincula lobata* (Torr.) Raf. PURPLE-FLOWERED GROUND-CHERRY. Perennial, spreading or prostrate, more or less scurfy-puberulent. Stem obtusely angled and striate. Leaves oblanceolate or spatulate to oblong, sinuately-toothed, or pinnatifid, with rounded lobes. Corolla purplish, 10"-15" in diameter. Anthers yellow, tinged with purple. Fruiting calyx about as wide as long, sharply 5-angled, sunken at the base.

On high plains. May-September. Frequent.

III. CHAMÆSARACHA A. Gray.

Scurfy, perennial herbs. Leaves alternate, entire, or pinnatifid, with winged petioles. Peduncles solitary, or 2 or 3 in the axils of the leaves. Calyx campanulate, 5-lobed, only accrescent, not becoming bladder-like in fruit, close-fitting to the berry. Corolla rotate, white or cream-colored, often tinged with purple, plicate. Stamens 5, inserted near the base of the corolla. Seeds reniform, flattened, rugose-favose or punctate.

Pubescence dense, puberulent and hirsute.

1. *C. coniioides*.

Pubescence sparse, puberulent, or stellate, hirsute (if at all) only on the calyx.

2. *C. Coronopus*.

1. *Chamaesaracha coniioides* (Moricand) Britton. HAIRY CHAM-

AESARACHA. Much-branched from a perennial base, cinereous-puberulent with short-branched, somewhat glutinous or viscid hairs. Leaves oblanceolate to obovate-rhombic, generally deeply-lobed, but varying from sub-entire to pinnatifid. Corolla about 6" in diameter, white, cream-colored or sometimes violet-purplish.

In dry clayey soil. May-September.

2. Chamæsaracha Coronopus (Dunal) A. Gray. **SMOOTHISH CHAMAESARACHA.** Branched and diffuse from a perennial base. Stem obtusely angled. Pubescence stellate, often scarcely any. Leaves linear or lanceolate, more or less sinuately-lobed, sometimes pinnatifid. Corolla white to yellowish-white, the appendages of the throat often protuberant. Berry 2½"-4" in diameter, nearly white.

In clayey soil. May-September.

IV. SOLANUM (Tourn.) L.

Annual or perennial, often prickly herbs, rarely vines. Leaves alternate, entire, toothed or pinnatifid. Flowers perfect, regular, in cymes, racemes, umbels, or panicles. Calyx from campanulate to rotate, 5-lobed. Corolla variously colored, rotate, 5-angled or 5-lobed, plicate. Stamens 5, adnate to throat of the corolla. Anthers narrow, converging or united into a cone, sacs opening by terminal pores. Ovary mostly 2-celled. Fruit a berry, seated in the calyx. Seeds flattened.

Glabrous or pubescent herbs, not prickly.

Plants green, pubescence simple, or some of it stellate; flowers white.

Leaves repand or entire; ripe berries black. 1. *S. nigrum*.

Leaves deeply pinnatifid; ripe berries green. 2. *S. triflorum*.

Plant silvery stellate-canescant; flowers violet. 4. *S. elaeagnifolium*.

Stellate-pubescent and prickly herbs.

Berry not enclosed by the calyx; perennials.

Hirsute; leaves ovate or oblong, sinuate or pinnatifid. 3. *S. carolinense*.

Densely silvery-canescant; leaves linear or oblong, repand or entire. 4. *S. elaeagnifolium*.

Pubescent; leaves ovate, 5-7-lobed. 5. *S. Torreyi*.

Berry partly or wholly invested by the spiny calyx; annuals. 6. *S. restratum*.

Climbing vine, not prickly; leaves hastate or 3-lobed.

7. *S. Dulcamara*.

1. *Solanum nigrum* L. DEADLY NIGHTSHADE. Annual, glabrous or downy with simple hairs. Leaves ovate, irregularly-toothed or entire, somewhat inequilateral, petioled. Flowers in lateral, peduncled umbels, small, white, drooping. Calyx lobes obtuse. Corolla 4"-6" wide. Filaments downy. Berries globose, smooth, black when ripe.

In waste places. May-October. Common.

2. *Solanum triflorum* Nutt. CUT-LEAVED NIGHTSHADE. Annual, sparingly pubescent or glabrous. Leaves pinnatifid or some of them pinnately-lobed, lobes entire or dentate. Flowers lateral. Calyx-segments persistent at the base of the berry. Corolla white, 4"-5" broad. Berries green when mature, globose, glabrous, about 5" in diameter.

Prairies and waste places. May-October.

3. *Solanum carolinense* L. HORSE-NETTLE. Perennial, finely stellate-pubescent with 4-8-rayed hairs, armed with straight, yellow prickles. Leaves ovate-oblong, deeply toothed or lobed, prickly on the veins. Racemes lateral, few-flowered. Calyx lobes taper-pointed, persistent at the base of the berry. Corolla lobes ovate-lanceolate, blue or white. Berries orange-yellow, globose, smooth, 8"-10" in diameter.

In cultivated fields and waste places. May-September. Common.

4. *Solanum elaeagnifolium* Cav. SILVER-LEAVED NIGHTSHADE. Perennial, densely and finely stellate pubescent, silvery-canescens all over. Sometimes armed with very slender, sharp prickles. Leaves lanceolate, or linear, 1'-4' long, 3"-12" wide, repand-dentate, or entire. Flowers cymose, 8"-12" broad, violet or blue. Berries globose, yellow or darker, 4"-6" in diameter.

On dry plains and prairies. May-September. Common.

5. *Solanum Torreyi* A. Gray. TERRY'S NIGHTSHADE. Perennial, pubescence stellate, hairs 8-12-rayed, more or less armed with small subulate prickles. Leaves ovate in outline, 3'-6' long, sinuately 5-7-lobed. Cymes loosely several-flowered. Flowers showy. Corolla violet, 1'-1½' broad. Berry globose, smooth and glabrous, 1' or more in diameter, yellow when ripe.

On dry prairies. April-September. Oklahoma County.

6. *Solanum restratum* Dunal. BUFFALO BUR. Annual, the whole plant beset with yellow prickles. Stem erect, diffusely

branched, 1°-2° high. Leaves broadly oval or ovate in outline, deeply pinnately-lobed or parted. Racemes few-flowered. Calyx very prickly, becoming enlarged, enclosing the fruit. Corolla bright yellow, about 1' broad.

On prairies. May-September. Common.

7. *Solanum Dulcamara* L. CLIMBING or BITTER NIGHTSHADE. Perennial, with simple hairs or glabrate. Stems shrubby, long, and climbing. Leaves heart-shaped, or with ear-like leaflets at the base. Flowers blue to purple, cyme. Berries showy, of many shades of orange and red in the same cluster.

In waste places. May-September.

FAMILY 79. SCROPHULARIACEÆ. FIGWORT FAMILY.

Herbs, shrubs or trees, with opposite or alternate, exstipulate leaves, and perfect, mostly complete, and irregular flowers. Calyx inferior, persistent, 4-5-toothed, cleft, or divided, or sometimes split on the lower side, or on both sides. Corolla gamopetalous, the limb 2-lipped, or nearly regular. Stamens 2, 4 or 5, didynamous, or nearly equal, inserted on the corolla and alternate with its lobes. Pistil 1, entire or 2-lobed. Ovary superior, 2-celled, or rarely 1-celled. Style slender, simple. Stigma entire, 2-lobed or 2-lamellate. Fruit mostly capsular.

Corolla spurred, saccate, or gibbous on the lower side at the base.

I. *Linaria*.

Corolla neither spurred, saccate, nor gibbous on the lower side.

Anther-bearing stamens 4, the fifth sterile or rudimentary.

Corolla tubular, 2-lipped, the lobes of the lower lip flat.

II. *Pentstemon*.

Corolla 2-cleft, declined; middle lobe of the lower lip conduplicate.

III. *Collinsia*.

Stamens 4, all anther-bearing, or 2 sterile, or 2 only.

Stamens 2 only; corolla rotate, salver-form, tubular, or none.

IV. *Veronica*.

Stamens 4, all anther-bearing, ascending under the upper lip of the corolla.

V. *Castilleja*.

I. *LINARIA* (Tourn.) Mill

Annual or perennial herbs, with erect stems. Leaves alternate or opposite, or whorled on the shoots. Flowers in terminal racemes, spikes, or panicles. Sepals 5, partially united. Corolla irregular, 2-lipped. Tube spurred at the base. Throat partly closed by a convex fold. Stamens 4, didynamous. Capsule ovoid or globose. Seeds angled and wrinkled, sometimes winged.

1. *Linaria canadensis* (L.) Dumort. BLUE or WILD TOAD-FLAX. Biennial or annual. Flowering stems erect, slender, rarely branched, smooth, 12'-24' high. Leaves linear, entire, sessile. Racemes erect, slender. Corolla small, blue and white, the spur thread-like, curved, longer than the pedicels. Capsule 2-valved.

In dry soil. April-September. Common.

II. *PENTSTEMON* Mitchell.

Perennial herbs, branching from the base only. Leaves opposite. Flowers showy, blue, purple, red, or white, in terminal panicles or racemes. Calyx 5-parted. Corolla irregular, the tube wide above and narrowed below, 2-lipped. Stamens 4 (2 long and 2 short), with a fifth, antherless, filament as long as the others, its upper half bearded. Capsule ovoid or globose.

More or less pubescent or glandular, at least the calyx and pedicels.

Corolla $\frac{1}{2}$ '-1 $\frac{1}{4}$ ' long; leaves entire, serrate, or denticulate.

Stem pubescent or puberulent nearly or quite to the base.

1. *P. hirsutus*.

Only the inflorescence, or pedicels, or calyx pubescent.

2. *P. Digitalis*.

Stem leaves oblong, ovate, or lanceolate.

Stem leaves linear-lanceolate. 3. *P. gracilis*.

Corolla 2' long, the tube much enlarged above; leaves dentate. 4. *P. Cobaea*.

Completely glabrous throughout, mostly glaucous.

Stem leaves rounded, clasping; flowers 2' long.

5. *P. grandiflorus*.

Stem leaves acute or acuminate; flowers 9"-15" long.

6. *P. acuminatus*.

1. **Pentstemon hirsutus** (L.) Willd. HAIRY BEARD-TONGUE. Stem somewhat downy, 1°-2° high. Leaves varying from oblong to lanceolate, 2'-4' long, usually with small teeth. Inflorescence thyr-soid, glandular pubescent. Corolla purplish or violet, the tube grad-ually dilated above, about 1' long, the throat nearly closed by the villous palate at the base of the lower lip. Sterile filament densely bearded for about one-half its length.

In dry woods and thickets. May-July.

2. **Pentstemon Digitalis** (Sweet) Nutt. FOXGLOVE BEARD-TONGUE. Glabrous except the glandular inflorescence. Lower and basal leaves oblong or oval, entire or repand, 2'-7' long. Upper leaves ovate, lanceolate, sharply denticulate. Thyrsus many-flow-ered. Corolla white, 1'-1¼' long, the tube abruptly dilated, the limb moderately 2-lipped, the throat open. Sterile filament bearded above.

In fields and thickets. May-July.

3. **Pentstemon gracilis** Nutt. SLENDER BEARD-TONGUE. Glabrous to the glandular-pubescent inflorescence. Stem 6'-18' high. Basal and lower leaves linear-oblong or spatulate, denticulate or entire, 1'-3' long, narrowed into margined petioles. Upper leaves sessile, linear-lanceolate, denticulate, acuminate. Thyrsus several many-flowered. Corolla purple, 9"-12" long, its tube gradually enlarged above. Sterile filament bearded for about one-half its length. Cap-sule one-third longer than the calyx.

On moist prairies. May-July. Frequent.

4. **Pentstemon Cobaea** Nutt. COBAEA BEARD-TONGUE. Stem densely and finely pubescent below, glandular-pubescent above, 1°-2° high. Leaves oblong to ovate, 3'-5' long, dentate, the lower glab-rous and narrowed into margined petioles, upper sessile or cordate-clasping, usually pubescent. Thyrsus several-many-flowered. Flow-ers about 2' long. Corolla purple, its tube narrowed up to the top of the calyx, then abruptly dilated and campanulate, the limb

scarcely 2-lipped. Sterile filament sparingly bearded. Capsule ovoid, pubescent, reticulate-veined, as long as the calyx.

On dry prairies. May-July. Common.

5. *Pentstemon grandiflorus* Nutt. LARGE-FLOWERED BEARD-TONGUE. Glabrous and somewhat glaucous. Stem 2°-4° high. Leaves all entire and obtuse, the basal ones obovate, narrowed into broad petioles, those of the lower part of the stem sessile, oblong or oval, 1'-2½' long, the upper nearly orbicular, cordate-clasping. Thyrsus leafy-bracted, the bracts orbicular and cordate. Flowers nearly 2' long. Corolla lavender-blue, the tube rather abruptly dilated above the calyx, the limb somewhat 2-lipped. The sterile filament incurved, villous and capitate at the summit. Capsule 8"-10" high, three times as long as the calyx.

On prairies. May-August. Blaine County.

6. *Pentstemon acuminatus* Dougl. SHARP-LEAVED BEARD-TONGUE. Glabrous and glaucous. Stem 6'-24' high, leafy. Leaves entire, the lower and basal ones oblong or spatulate, narrowed into petioles, the upper sessile or clasping, lanceolate or ovate-lanceolate, 2'-3' long. Thyrsus sometimes one-sided, usually leafy-bracted below. Corolla blue, 9"-10" long, its tube rather gradually dilated, limb 2-lipped. Sterile filament bearded along the dilated summit. Capsule twice as long as the calyx.

In dry soil. May-August. Blaine County.

III. *COLLINSIA* Nutt.

Winter-annual or biennial herbs. Leaves opposite or verticillate. Flowers blue, pink, white, or variegated, verticillate or solitary in the axils. Calyx campanulate, 5-cleft. Corolla irregular, 2-lipped. Stamens 4, didynamous. Corolla with a gland on the upper side of the tube near the base. Stigma capitate or 2-lobed. Capsule ovoid or globose. Seeds peltate, concave on the inner side.

1. *Collinsia verna* Nutt. BLUE-EYED MARY. Glabrous or puberulent. Stem 6'-24' long, simple, or branched. Leaves opposite, the lower broadly ovate or orbicular, crenate or entire, slender-petioled. Middle leaves sessile or cordate-clasping, ovate or oblong, dentate, 1'-2' long, floral leaves ovate to spatulate, dentate or entire. Upper whorls 4-6-flowered. Corolla 6"-8" long, its lower lip blue, the upper purple or nearly white, the lobes emarginate or truncate. Capsule globose, shorter than the linear calyx-lobes.

In moist soil. April-June. Wichita and Arbuckle Mountains.

IV. VERONICA (Tourn.) L.

Low, annual or perennial, caulescent herbs. Leaves opposite or sometimes alternate, entire or toothed. Flowers axillary, racemose, or spicate. Sepals 4, slightly united at the base. Corolla whitish or blue, rotate, slightly irregular, the lower lobe usually narrowest. Stamens 2, on either side of the upper corolla lobe. Ovary 2-celled. Capsule flat, emarginate, or 2-lobed. Seeds smooth or rough, flattened or concave on the sides.

Erect; glabrous or glandular; capsule emarginate.

1. *V. peregrina*.

Diffuse; pubescent; capsule obcordate.

2. *V. arvensis*.

1. **Veronica peregrina** L. PURSLANE SPEEDWELL. Glandular, pubescent, or nearly smooth, erect, 3'-12' high. The lowest leaves petioled or sessile, oval-oblong, toothed, the others sessile. The upper leaves oblong-linear and entire, each with a short-pedicelled white flower in its axil. Flowers about 1" broad. Capsule nearly orbicular, obcordate, usually a little shorter than the calyx, many-seeded, the seeds flat.

In moist soil and waste places. March-August. Frequent.

2 **Veronica arvensis** L. CORN or WALL SPEEDWELL. Annual, pubescent. Simple or diffusely branched, with stems 3'-10' long. Lower leaves petioled, ovate, crenate. The uppermost sessile, lanceolate, commonly entire. each with a short, pedicelled, minute flower in its axil. Corolla blue or nearly white, 1" broad or less. Capsule broadly obovate, obcordate, 1" high.

March-September. In fields, woods and waste places. Oklahoma County.

V. CASTILLEJA Mutis.

Annual or perennial herbs. Leaves alternate. Flowers red, yellow, purple, or white, in dense, leafy, bracted spikes. Calyx laterally flattened, 4-lobed, more deeply cleft above and below than on the sides. Corolla very irregular, 2-lipped. Upper lip arched, concave or keeled, entire, enclosing the 4 didynamous stamens. Lower lip 3-lobed. Anther-sacs unequal, the outer attached by the middle, the inner by its apex, pendulous. Capsule ovoid or oblong. Seeds reticulated.

Plants villous-pubescent.

1. *C. coccinea*.

Plants glabrous, woolly at the summit, or cinereous-puberulent.

2. *C. sessiliflora*.

1. **Castilleja coccinea** (L.) Spreng. **SCARLET PAINTED CUP.** Indian Paint-brush. Annual or biennial. Stem simple. Root-leaves clustered, mostly entire, obovate or oblong, those of the stem incised. The bracts 3-5-lobed or cleft, bright red or scarlet. Calyx about the length of the pale yellow corolla, equally cleft on both sides. Capsule oblong, acute, 3"-6" long.

In meadows and moist thickets. May-July.

2. **Castilleja sessiliflora** Pursh. **DOWNY PAINTED CUP.** Perennial, cinereous-pubescent, very leafy. Stem 6'-15' high. Leaves sessile, 1'-2' long, the lowest commonly linear, entire, the others mostly cleft. Bracts green, similar to the upper leaves. Corolla yellowish, 18" long, the upper lip about twice as long as the lower, the lobes of the latter linear. Capsule oblong-lanceolate, 6"-8" long.

On dry prairies and hills. May-July. Comanche County.

FAMILY 80. BIGNONIACEÆ. TRUMPET-CREEPER FAMILY.

Trees, shrubs or woody vines, with opposite, compound or simple leaves, and mostly large and showy, clustered, terminal or axillary, more or less irregular flowers. Calyx inferior, gamosepalous. Corolla gamopetalous, funnel-form, campanulate, or tubular, 5-lobed, somewhat 2-lipped. Anther-bearing stamens 2 or 4, inserted on the tube of the corolla and alternate with its lobes. Ovary sessile or stalked, mostly 2-celled. Style slender. Stigma terminal, 2-lobed. Capsule 2-valved.

I. CATALPA Scop.

Trees. Leaves large, opposite, simple, petioled, deciduous. Flowers large, showy, white or mottled, in terminal panicles or corymbs. Calyx irregularly 2-lipped. Corolla tubular-bell-shaped, oblique, 5-lobed, 2-lipped. Fertile stamens 2, sterile stamens 3, short. Fruit a linear, 2-valved, many-seeded capsule. Seeds winged.

1. **Catalpa speciosa** Warder. WESTERN CATALPA. A large tree with thick, rough bark. Leaves large, heart-shaped, or broadly ovate, long acuminate. Corolla 1'-2' long, nearly white, faintly spotted within. Capsule thick-walled, 8'-20' long, nearly 10" in diameter. Planted for shade. May-June.

FAMILY 81. ACANTHACEÆ. ACANTHUS FAMILY.

Herbs or shrubs, with opposite, simple, ex-stipulate leaves, and irregular or nearly regular, perfect flowers. Calyx inferior, persistent, 4-5-parted or 4-5-cleft. Corolla gamopetalous, nearly regularly 5-lobed, or conspicuously 2-lipped. Anther-bearing stamens 4, didynamous, or 2 only. Ovary 2-celled. Ovules 2-10 in each cavity. Style filiform, simple. Stigmas 1 or 2. Capsule dry, 2-celled, 2-valved. Seeds globose or orbicular, not winged, borne on curved projections from the placentæ.

Corolla convolute in the bud, nearly regular; stamens 4.

I. Ruellia.

Corolla imbricated in the bud, strongly 2-lipped; stamens 2.

II. Dianthera.

I. RUELLIA (Plumier) L.

Perennial herbs or shrubs. Leaves entire or, rarely, dentate. Flowers large, violet, blue, white, or yellow, solitary or clustered in the axils. Calyx 5-cleft, or 5-parted. Corolla funnel-form or salver-form, the limb spreading, 5-lobed. Stamens 4, stigma simple or of two unequal lobes. Capsule oblong or club-shaped. Seeds compressed, ovate, or orbicular.

Calyx-segments linear-lanceolate, scarcely exceeding the capsule.

1. *R. strepens*.

Calyx-segments filiform-linear, exceeding the capsule.

2. *R. ciliosa*.

1. **Ruellia strepens** L. SMOOTH RUELLIA. Glabrous or sparingly

pubescent. Stem simple or branched, 4-sided, 1°-4° high. Leaves oblong or ovate, 3'-6' long. Flowers solitary or several together in axils. Corolla blue, 18"-24" long. Capsule club-shaped, longer than or equaling the calyx.

In dry woods. May-July. Frequent.

2. *Ruellia ciliosa* Pursh. HAIRY RUELLIA. Hirsute or pubescent. Stem 12'-30' high. Leaves hairy, ciliate, oblong or ovate, sessile or nearly so, 1½'-3' long. Flowers clustered or solitary in the axils. Corolla blue, 1½'-2' long. Capsule shorter than the calyx.

In dry soil. May-September. Common.

II. DIANTHERA L.

Herbs mostly perennial. Leaves opposite, entire or toothed. Flowers irregular, axillary, solitary or clustered in the axils. Calyx 5-parted. Corolla 2-lipped. Upper lip erect, concave, entire or notched. The lower prominently veined, spreading, 3-lobed. Stamens 2, inserted on the throat of the corolla. Ovary 2-celled, 4-ovuled. Style simple, acute. Stigma entire, or 2-lobed. Capsule flattened, narrowed below into a little stalk. Seeds flat, orbicular or ovate.

1. *Dianthera americana* L. DENSE-FLOWERED WATER WILLOW. Perennial, glabrous. Stem grooved and angled, usually simple, 12'-30' high. Leaves lanceolate or linear-lanceolate, 3'-6' long, entire. Flowers violet or nearly white, capitate-spicate at the ends of slender, axillary peduncles. Bractlets linear-subulate, shorter than the flowers. Corolla 5"-6" long, its tube shorter than the lips, the base of the lower lip rough and palate-like. Capsule 6" long.

In waste and wet places. May-August. Comanche and Pottawatomie counties.

FAMILY 82. PLANTAGINACEÆ. PLANTAIN FAMILY.

Annual or perennial, mostly acaulescent, herbs, with 1-several-ribbed or nerved radical leaves, and small, perfect, polygamous or monœcious flowers, bracteolate in dense, terminal, long-scaped spikes or heads, or, rarely, solitary. Calyx 4-parted, inferior, persistent. Corolla hypogynous, scarious or membranous, mostly marcescent,

4-lobed. Stamens 4 or 2, inserted on the tube or throat of the corolla. Ovary sessile, superior, 1-2-celled, or falsely 3-4-celled. Style filiform, simple. Ovules 1-several in each cavity of the ovary, peltate. Fruit apyxis, circumscissile at or below the middle, or an indehiscent nutlet.

I. PLANTAGO (Tourn.) L.

Acaulescent or leafy-stemmed herbs, the scapes arising from the axils of the basal or alternate leaves, bearing terminal spikes or heads of small greenish or purplish flowers. Calyx-segments equal, or two of them larger. Corolla salver-form, the tube cylindric, or constricted at the throat, the limb spreading in anthesis. Fruit a pyxis, mostly 2-celled. Seeds with flattened or concave faces.

Flowers mainly dioecious; corolla lobes erect or closed over the capsules.

Stamens 2; leaves linear to filiform.

1. *P. elongata*.

Stamens 4; leaves with comparatively broad blades.

Bracts and calyx-lobes obtuse; seeds golden yellow.

2. *P. virginica*.

Bracts and calyx-lobes acute or acuminate; seeds red or fuscous.

3. *P. occidentalis*.

Flowers perfect; corolla-lobes spreading or reflexed on top of the capsules.

Annuals; heterogenous.

Bracts not aristate, not over twice as long as the flowers.

4. *P. Purshii*.

Bracts aristate, 2 or more times as long as the flowers.

Bracts linear-subulate to tapering-linear; plants not drying dark brown.

5. *P. spinulosa*.

Bracts strictly linear, except at the apex; plants drying dark brown.

6. *P. aristata*.

Perennials; proterogynous.

Calyx-lobes various, the lower united, the upper nearly distinct. 7. *P. lanceolata*.

Calyx-lobes all essentially distinct.

Capsules conic or oblong-conic, circumscissile below the middle. 8. *P. Rugelii*.

Capsules ovoid, circumscissile at about the middle. 9. *P. major*.

1. ***Plantago elongata*** Pursh. SLENDER PLANTAIN. Minutely pubescent, $1\frac{1}{2}'$ - $6\frac{1}{2}'$ high. Leaves linear to filiform, entire. Capsule short-ovoid, 4-seeded, little exceeding the calyx and bract.

Sandy soil. April-August. Kingfisher County.

2. ***Plantago virginica*** L. DWARF PLANTAIN. Hairy or hoary-pubescent, 2'-16' high. Leaves oblong, varying to obovate and spatulate-lanceolate, 3-5-nerved, slightly or coarsely and sparingly toothed. Spikes mostly dense, $\frac{1}{2}'$ - $3\frac{1}{2}'$ long. Mature corolla slender, cylindric. Seeds usually 2, brown or yellowish.

In dry soil. March-July. Frequent.

3. ***Plantago occidentalis*** Dec. WESTERN PLANTAIN. Annual or biennial, pubescent. Leaves 3'-8' long or more, spatulate to spatulate-lanceolate, 3-5-nerved, entire to strongly repand-lobed. Scape 4'-8' tall. Spikes 1'-6' long, densely-flowered. Flowers dioecious. Corolla smooth, lobes narrowly ovate, subcordate. Capsule circumscissile below the middle.

In dry soil. April-July.

4. ***Plantago Purshii*** R. & S. PURSH'S PLANTAIN. White, with silky wool. Leaves 1-3-nerved, varying from oblong-linear to filiform. Spikes slender, cylindric, very dense, $1\frac{1}{2}'$ -6' long, woolly. Bracts not exceeding the calyx. Sepals scarious.

On dry plains and prairies. May-August. Common.

5. ***Plantago spinulosa*** Decne. LARGE-BRACTED PLANTAIN. Annual, pale green, pubescent. Leaves 2'-5' long, linear to spatulate-linear, callous-tipped, entire, 3-nerved. Scapes 2'-4' high, villous. Spikes rather interrupted, 1'-3' long, villous. Bracts linear-subulate, 3"-8" long. Flowers perfect. Corolla glabrous, lobes ovate, cordate. Capsule circumscissile at the middle. Seeds dark brown.

On dry plains and prairies. May-October. Frequent.

6. ***Plantago aristata*** Michx. LARGE-BRACTED PLANTAIN. Annual dark green, villous or glabrate. Scapes 6'-18' high. Leaves linear, entire, 3-ribbed. Spikes very dense, cylindric, 1'-6' long, pubescent but not woolly. Bracts linear, 5"-15" long. Capsule circumscissile at the middle.

On dry plains and prairies. May-October. Common.

7. *Plantago lanceolata* L. ENGLISH or RIPPLE PLANTAIN. Mostly hairy. Scape grooved-angled, at length much longer than the lanceolate or lanceolate-oblong leaves, slender, 8'-28' high. Spike dense, at first capitate, in age cylindrical. Bracts and sepals scarious, brownish.

In fields and waste places. April-November. Frequent.

8. *Plantago Rugellii* Decene. RUGEL'S PLANTAIN. Leaves long-petioled, thin in texture, crimson at base, mostly ovate, entire or coarsely dentate, 1'-10' long, 3-11-ribbed. Spikes long and thin, attenuate at the apex. Capsules oblong-cylindric, circumscissile much below the middle, 4-9-seeded.

In fields, woods and waste places. May-September. Payne County.

9. *Plantago major* L. COMMON PLANTAIN. Perennial, glabrous, or somewhat pubescent. Leaves long-petioled, firm in texture, mostly ovate, entire, or coarsely dentate, 1'-10' long, 3-11-ribbed. Scapes 2'-3' high. Spikes linear-cylindric, usually very dense, 2'-10' long. Flowers perfect, proterogynous. Capsule circumscissile at about the middle.

In waste places. May-September. Payne County.

FAMILY 83. RUBIACEÆ. MADDER FAMILY.

Erect or diffuse, usually tufted herbs, with opposite, entire, often ciliate, leaves, and small, blue, purple, or white, mostly dimorphous flowers. Calyx-tube globose or ovoid, 4-lobed, the lobes distinct. Corolla funnel-form or salver-form, 4-lobed, the lobes valvate, the throat globose-didymous, or emarginate at the apex. Seeds few or several in each cavity, peltate, more or less concave, not angled. Seed-coats reticulate or roughened.

Leaves opposite, stipulate.

I. *Houstonia*.

Leaves appearing verticillate; herbs; ovule 1 in each cavity of the ovary.

II. *Galium*.

I. *HOUSTONIA* L.

Erect or diffuse, usually tufted herbs. Leaves opposite, entire, often ciliate. Flowers small, blue, purple or white, mostly dimorphous. Calyx-tube globose

or ovoid, 4-lobed. Corolla funnel-form or salver-form, 4-lobed, the lobes valvate. Stamens 4, inserted on the tube or throat of the corolla. Ovary 2-celled. Stigmas 2, linear. Capsule partly inferior, more or less distinctly 2-lobed. Seeds more or less concave.

Plants 1'-7' high; peduncles 1-flowered.

Calyx-lobes narrow, about equaling the capsule.

1. *H. patens*.

Calyx-lobes broad, much exceeding the capsule.

2. *H. minima*.

Plants 4'-18' high; flowers cymose.

3. *H. angustifolia*.

1. **Houstonia patens** Ell. SMALL BLUET. Annual, glabrous or nearly so, branched from the base, 1'-6' high. Lower and basal leaves oval or ovate, 5"-6" long, the upper narrower and sessile. Peduncles axillary and terminal, 1-flowered. Corolla violet-blue or purple, 3"-4" broad. Capsule compressed, didymous.

In dry soil. March-April.

2. **Houstonia minima** Beck. LEAST BLUETS. Annual, spreading or diffuse, 1'-2½' high. Lower and basal leaves oval or ovate, the upper oblong, sessile. Peduncles axillary and terminal, 3"-12" long. Flowers 4"-5" broad. Corolla violet or purple. Capsule compressed, didymous.

In dry soil. March-April. Common.

3. **Houstonia angustifolia** Michx. NARROW-LEAVED HOUSTONIA. Perennial by a deep root, glabrous, usually branched, 12'-24' high. Leaves linear, 6"-18" long, 1"-3" wide, or the lowest narrowly spatulate, usually with numerous smaller ones fasciated in the axils. Flowers in terminal, dense, cymose clusters. Corolla white or purplish, from funnel-form to salver-form, about 2" long. Capsule compressed-obovoid.

In dry, open places. May-July. Common.

II. GALIUM L.

Annual or perennial herbs, with 4-angled stems and branches. Leaves apparently verticillate. Flowers small, white, green, yellow or purple, in axillary or terminal cymes or panicles. Flowers perfect, or in some species dioecious. Calyx-tube ovoid or globose. Corolla rotate, 4-lobed. Stamens 4. Ovary 2-celled. Styles 2, short. Stigmas capitate.

Fruit didymous, dry or fleshy, smooth, tuberculate, or hispid.

Annuals; fruit densely bristly-hispid. 1. *G. Aparine*.

Perennials.

Fruit bristly hispid.

Leaves in 4's, 1-nerved.

2. *G. pilosum*.

Leaves in 4's, 3-nerved.

3. *G. circaezans*.

Fruit smooth or warty.

4. *G. tinctorium*.

1. **Galium Aparine** L. CLEAVERS. Annual, weak, scrambling over bushes, 2°-5° long, the stems retrosely hispid on the angles. Leaves in 6's or 8's oblanceolate to linear, 1'-3' long, the margins and midrib very rough. Flowers in 1-3 flowered cymes in the upper axils. Fruit densely covered with short, hooked bristles.

Woods and waste places. April-September. Common.

2. **Galium pilosum** Ait. HAIRY BEDSTRAW. Perennial, hirsute-pubescent or glabrate. Stems ascending, branched, 1°-2½° long. Leaves in 4's, oval or oval-ovate, punctate, 1-nerved, 4"-12" long. Peduncles axillary and terminal. Cymes numerous but few-flowered. Flowers yellowish-purple. Fruit dry, densely hispid.

In dry or sandy soil. May-August. Lincoln and Cleveland counties.

3. **Galium circaezans** Michx. WILD LIQUORICE or CROSS-CLEAVERS. Perennial, pubescent or glabrate, branched, 12'-24' high. Leaves in 4's, oval to oval-lanceolate, 3-nerved, 6"-18" long, cymes divaricately branched. Flowers greenish. Fruit hispid.

In dry woods. May-July. Frequent.

4. **Galium tinctorium** L. STIFF MARSH BEDSTRAW. Perennial. Stem 6'-15' high, branched almost to the base. Stem 4-angled, nearly glabrous. Leaves commonly in 4's, linear to lanceolate, 6"-12" long, 1-nerved, the margins and midrib roughish. Flowers terminal in clusters of 2 or 3. Corolla white, 1"-1¾" broad, 4-parted. Fruit smooth.

Damp, shady places, wet meadows and swamps. May-July. Cleveland County.

FAMILY 84. CAPRIFOLIACEÆ. HONEYSUCKLE FAMILY.

Shrubs, trees, vines, or perennial herbs, with opposite, simple or pinnate leaves, and perfect, regular or irregular, mostly cymose flowers. Calyx-tube adnate to the ov-

ary, its limb 3-5-toothed or 3-5-lobed. Corolla gamopetalous, rotate, campanulate, funnel-form, urn-shaped, or tubular, the tube often gibbous at the base, the limb 5-lobed, sometimes 2-lipped. Stamens 5, inserted on the tube of the corolla and alternate with its lobes. Ovary inferior, 1-6-celled. Stigma capitate, or 2-5-lobed. Fruit a 1-6-celled berry, drupe, or capsule. Seeds oblong, globose, or angular.

Corolla rotate or urn-shaped; flowers in compound cymes; styles deeply 2-5-lobed; shrubs or trees.

Leaves pinnate; drupe 3-5-seeded. **I. Sambucus.**

Leaves simple; drupe 1-seeded. **II. Viburnum.**

Corolla tubular or campanulate, often 2-lipped; style slender.

Erect, perennial herbs; leaves connate.

III. Triosteum.

Shrubs or vines.

IV. Symphoricarpos.

I. SAMBUCUS (Tourn.) L.

Shrubs with odd-pinnate leaves. Calyx limb minute or wanting. Flowers very many, small, white, in compound cymes. Corolla with a small, somewhat urn-shaped tube, and a flattish, spreading, 5-cleft limb. Stamens 5. Stigmas 3, sessile. Fruit a globular, pulpy drupe, 3-seeded, appearing like a berry.

1. Sambucus canadensis L. AMERICAN ELDER. A shrub, 4°-10° high, glabrous or very nearly so, the stems but little woody, the younger ones with large white pith. Leaflets 5-11, usually 7, ovate or oval, 2'-5' long, sharply serrate, sometimes stipellate. Cymes convex. Flowers white, about 1½" broad. Drupe deep purple or black.

In moist soil. May-July. Frequent.

II. VIBURNUM (Tourn.) L.

Shrubs or small trees. Leaves simple, entire, dentate

or lobed, with or without stipules. Flowers small, white, in terminal cymes. The outer flowers of the cyme sometimes greatly enlarged and sterile. Calyx-tube very small, 5-toothed. Corolla wheel-shaped or bell-shaped, 5-lobed. Stamens 5, inserted on the tube of the corolla. Ovary 1-3-celled. Style short, 3-lobed. Fruit a 1-seeded drupe.

Leaves and scarcely-winged petioles glabrous, or nearly so. 1. *V. prunifolium*.

Veins of lower leaf-surfaces and winged petioles tomentose. 2. *V. rufidulum*.

1. **Viburnum prunifolium** L. BLACK HAW. A shrub or small tree. Leaves short-petioled, ovate or broadly oval, 1'-3' long, finely serrulate. Petioles rarely margined. Cyme sessile, several-rayed, 2'-4' broad. Drupe oval, bluish-black and glaucous.

In dry soil. April-June. Common.

2. **Viburnum rufidulum** Raf. SOUTHERN BLACK HAW. A small tree, becoming 20° high. Leaves elliptic to obovate, finely and sharply serrate or serrulate, the veins brown-tomentose beneath. Petioles 3"-8" long, winged, brown-tomentose. Cymes large, the principal rays 3-5, mostly 4. Flowers 2½"-3" broad. Drupe oval, blue with a bloom.

In woods and thickets. April-May. Common.

III. TRIOSTEUM L.

Perennial herbs. Leaves opposite, connate-perfoliate or sessile, narrowed below the middle. Flowers axillary, perfect, solitary or clustered, sessile, yellowish, green, or purplish, 2-bracted. Calyx-tube ovoid, 5-lobed, foliaceous. Corolla-tube campanulate, gibbous at the base. Stamens 5, inserted on the corolla-tube. Ovary 3-5-celled. Stigma 3-5-lobed. Drupe coriaceous, orange or red, enclosing 2-3 1-seeded nutlets.

1. **Triosteum perfoliatum** L. FEVER-WORT. Stem finely glandular-pubescent, 2°-4° high. Leaves ovate to broadly oval, 4'-9' long, 2'-4' wide, connate-perfoliate, soft-pubescent beneath, somewhat hairy above, the margins entire or sinuate. Bracts linear. Corolla dull purplish-brown, greenish below, 6"-10" long, viscid-pubescent. Filaments bearded. Drupe obovoid-globose, orange-yellow, densely and finely pubescent.

In rich soil. May-July.

IV. SYMPHORICARPOS (Dill.) Ludwig.

Shrubs. Leaves opposite, simple, short-petioled, deciduous. Flowers small, white or pink, perfect, in axillary or terminal clusters. Calyx-tube globose, 4-5 toothed. Corolla campanulate or salver-form, regular, or sometimes gibbous at the base, 4-5-lobed. Stamens 4-5, inserted on the corolla. Ovary 4-celled, 2 of the cells with a single, fertile ovule in each, the other cells with several, abortive ovules. Stigma capitate, or 2-lobed. Fruit an ovoid or globose 4-celled 2-seeded berry.

1. Symphoricarpos Symphoricarpos (L.) Macm. CORAL-BERRY or BUCK-BUSH. A shrub, 2°-5° high, purplish, usually pubescent. Leaves oval or ovate, entire or undulate, glabrous above, soft pubescent beneath, 12"-18" long. Corolla campanulate, pinkish, about 2" long. Style bearded. Berry purplish red, persistent.

Along streams and ravines. June-July. Common.

FAMILY 85. VALERIANACEÆ. VALERIAN FAMILY.

Herbs, with opposite leaves, no stipules, and usually small, perfect or polygamo-diœcious flowers, in corymb, panicle, or capitate cymes. Calyx-tube adnate to the ovary. Corolla gamopetalous, epigynous, somewhat irregular, its tube narrowed, and sometimes gibbous or spurred at the base, mostly 5-lobed. Stamens 1-4, inserted on the corolla and alternate with its lobes. Ovary inferior, 1-3-celled. Fruit indehiscent, dry.

I. VALERIANELLA (Tourn.) Mill.

Annual, dichotomously branched herbs. Basal leaves tufted, entire, those of the stem sessile, often dentate. Flowers in terminal, bracted cymes. Corolla small, white, blue, or pink, nearly regular. Calyx-limb toothed or wanting. Corolla-tube narrowed at the base, the limb spreading, 5-lobed. Stamens 3. Style 3-lobed. Fruit 3-celled, 2 of the cells empty.

Corolla funnel-form, the short tube not longer than the limb or about equaling it. I. *V. radiata*.

Corolla salver-form, purplish, the slender tube much longer than the limb. 2. *V. longiflora*.

1. **Valerianella radiata** (L.) Dufr. BEAKED CORN SALAD. Glabrous or minutely pubescent, 6'-18' high. Lower leaves spatulate, entire, upper lanceolate, usually dentate. Bracts small, lanceolate. Corolla white, 1" long. Fruit ovate-tetragonal, finely pubescent or glabrate, 1" long.

In moist soil. April-July. Common.

2. **Valerianella longiflora** (T. & G.) Walt. LONG-FLOWERED CORN SALAD. Glabrous, erect, 6'-12' high, annual. Leaves oblong, 1'-2½' long. The lower spatulate, smaller, somewhat clasping. Corolla salver-form, pink or purplish, about 6" long. Bracts with small, gland-tipped teeth. Fruit broadly ovate or nearly orbicular in outline.

Rocky soil. April-May.

FAMILY 86. CUCURBITACEÆ. GOURD FAMILY.

Climbing or trailing, herbaceous vines, usually with tendrils. Leaves alternate, petioled; generally palmately-lobed or dissected. Flowers solitary or racemose, monœcious. Calyx-tube adnate to the ovary, its limb campanulate or tubular, usually 6-lobed. Petals usually 5, inserted on the limb of the calyx, separate, or united into a gamopetalous corolla. Stamens mostly 3 (sometimes 1) 2 of them with 2-celled anthers, the other with a 1-celled anther. Ovary 1-3-celled. Fruit a pepo, sometimes dry.

Flowers large, yellow; prostrate vine. I. **Pepo**.

Flowers small, white or greenish; climbing vines.

II. **Cyclanthera**.

I. PEPO (Tourn.) Mill.

Rough, prostrate vines, rooting at the nodes, with

branched tendrils. Leaves lobed, mostly cordate at the base. Flowers large, yellow, axillary, monœcious. Calyx-tube campanulate, usually 5-lobed. Corolla campanulate, 5-lobed to about the middle, the lobes re-curving. Staminate flowers with 3 stamens and no pistil. Pistillate flowers with 1-pistil. Ovary oblong. Stigmas 3-5, each 2-lobed, papillose. Staminodia 3. Fruit large, fleshy, with a thick rind.

1. **Pepo foetidissima** (H. B. K.) Britton. MISSOURI GOURD. Stem stout, scabrous, trailing to a length of 15°-25°. Root large, carrot-shaped. Leaves ovate-triangular, thick and somewhat fleshy, cordate or truncate at the base, 4'-12' long, denticulate, rough above, canescent beneath. Flowers mostly solitary. Corolla 2½'-4' long. Pepo globose, 2'-3' in diameter, smooth.

In dry soil. May-September. Common.

II. CYCLANTHERA Schrad.

Annual or perennial, climbing, mostly glabrous vines, with forked or simple tendrils. Leaves digitately compound. Flowers small, white or greenish, monœcious. Calyx cup-shaped, 5-toothed. Corolla rotate, 5-parted. Staminate flowers racemose or paniced, the stamens united into a central column. Pistillate flowers solitary. Ovary obliquely ovoid, beaked, 1-3-celled. Fruit spiny, obliquely ovoid, beaked.

1. **Cyclanthera dissecta** (T. & G.) Arn. CUT-LEAVED CYCLANTHERA. Annual, stem smooth and angular, glabrous, branching, climbing to a height of 3°-4°. Leaves digitately 3-7-foliolate, the leaflets rough on both sides, dentate, or somewhat lobed. Staminate flowers racemose. Pistillate flowers solitary. Fruit narrowed at the base, slightly oblique, about 1' long, armed with slender spines.

Thickets. May-September. Wichita Mountains.

FAMILY 87. CAMPANULACEÆ. BELLFLOWER FAMILY.

Herbs with milky juice. Leaves alternate, without stipules. Flowers epigynous, actinomorphic, not clustered. Calyx 5-lobed. Corolla regular, bell-shaped, 5-lobed. Stamens 5, usually free from the corolla and not

united. Style 1, usually hairy above. Stigmas 2 or more. Fruit a capsule, 2 or more celled, many-seeded.

I. SPECULARIA Heist.

Annual or biennial herbs. Leaves alternate, sessile, or clasping. Flowers of two kinds, the earlier ones cleistogamous, close-fertilized in the bud, with a calyx of 3-4 sepals and an undeveloped corolla, the later ones with 5 sepals and a rotate or funnel-form corolla. Stamens 5. Ovary 2-celled. Stigmas 3. Capsule prismatic or cylindric.

Capsule narrowly oblong.

Leaves sessile; capsule-valves near the top.

1. *S. biflora*.

Leaves cordate-clasping; capsule-valves at about the middle.

2. *S. perfoliata*.

Capsule linear-cylindric; leaves sessile; western.

3. *S. leptocarpa*.

1. *Specularia biflora* (R. & P.) F. & M. SMALL VENUS' LOOKING-GLASS. Glabrous, or nearly so. Stem simple or branched, roughish on the angles, 6'-2° high. Leaves ovate, oblong, or upper lanceolate, crenate with a few teeth, or entire, 4"-10" long. Capsule oblong-cylindric.

In dry soil. April-July. Frequent.

2. *Specularia perfoliata* (L.) A. DC. VENUS' LOOKING-GLASS. Pubescent. Stem densely leafy, simple or branched from near the base, retrorse-hispid on the angles, 6'-24' long. Leaves orbicular or broadly ovate, strongly cordate-clasping or the lower nearly sessile. crenate-dentate or sometimes entire. Flowers solitary or 2-3 together in the axils, and a rotate blue or violet corolla, 5"-10" broad. Capsule oblong, or narrowly turbinate.

In dry woods and waste places. May-September. Common.

3. *Specularia leptocarpa* (Nutt.) A. Gray. WESTERN VENUS' LOOKING-GLASS. Hirsute, or nearly glabrous. Stem simple or branched from the base, 6'-15' high. Leaves linear-lanceolate to oblong, sessile, not clasping, entire or sparingly denticulate, 6"-12" long. Flowers sessile and usually solitary in the axils. Corolla rotate, 5"-9" broad. Capsule linear-cylindric.

In dry soil. May-August. Infrequent.

FAMILY 88. LOBELIACEÆ. LOBELIA FAMILY.

Herbs, often with milky sap which contains a narcotic-acid poison, with alternate, ex-stipulate, simple, entire, toothed or pinnately parted leaves and solitary, spicate, racemose or paniculate flowers. Calyx-tube adnate to the ovary, its limb 5-lobed or 5-parted. Corolla gamopetalous, irregular, often bilabiate, its limb 5-lobed. Stamens 5, inserted with the corolla. Ovary 2-5-celled. Stigma fringed. Fruit a 1-5-celled capsule, or a berry. Seeds numerous, smooth or furrowed.

I. LOBELIA L.

Herbs. Leaves alternate, simple, entire, toothed or pinnately parted. Flowers solitary, spicate, racemose or paniculate. Calyx-tube adnate to the ovary, 5-lobed or 5-parted. Corolla gamopetalous, irregular, often bilabiate, 5-lobed. Stamens 5, inserted with the corolla. Ovary 2-5-celled. Stigma fringed. Fruit a 1-5-celled capsule, or a berry.

1. *Lobelia leptostachys* A. DC. SPIKED LOBELIA. Perennial or biennial, puberulent. Stem 2°-4° high. Basal leaves oval or obovate. Stem leaves spatulate, oblong, or lanceolate, denticulate or entire. Spike-like raceme elongated, usually dense. Bracts linear, glabrous. Calyx lobes linear-subulate, the sinuses with subulate, deflexed auricles. Flowers blue, 4"-5" long.

In dry soil. May-August. Comanche County.

FAMILY 89. CICHORIACEÆ. CHICORY FAMILY.

Herbs, almost always with milky, acrid, or bitter juice, alternate or basal leaves, and yellow, rarely pink, blue, purple, or white flowers in involucrate heads. Bracts of the involucre in one to several series. Receptacle of the head flat or flattish, naked, scaly, smooth, pitted, or

honeycombed. Flowers all alike, perfect. Calyx-tube completely adnate to the ovary, its limb (pappus) of scales, or simple or plumose bristles, or both, or wanting. Corolla gamopetalous, with a short or long tube, and a strap-shaped, usually 5-toothed limb (ray). Anthers connate into a tube around the style. Ovary 1-celled. Fruit an achene.

Pappus of scales, or of scales and bristles, or none.

Pappus none; achenes 8-10-ribbed. **I. Serinia.**

Pappus of rounded scales, with or without an inner series of bristles.

Bracts of the involucre 9-18, reflexed in fruit, not keeled; pappus-bristles usually more numerous than the scales.

Annuals; pappus-scales 5, obovate or rounded.

II. Krigia.

Perennials; pappus-scales 10-15, linear or oblong, minute.

III. Cynthia.

Bracts of the involucre 5-8, erect in fruit, keeled; pappus-bristles and scales 5.

IV. Cymbia.

Pappus, at least some of it, of plumose bristles.

V. Tragopogon.

Pappus, of simple bristles or of some soft white scales.

Achenes spinulose, or with short processes near the summit.

VI. Leontodon.

Achenes smooth, or papillose, not spinulose toward the summit.

Achenes flattened.

VII. Sonchus.

Achenes cylindric, or prismatic.

Pappus-bristles not surrounded by villous ring at base.

VIII. Agoseris.

Pappus-bristles surrounded by a villous white ring
at base.

IX. *Sitilias*.

I. *SERINIA* Raf.

Low, glaucescent, branching annual herbs. Leaves alternate, clasping, entire, or lobed, and few, small, long-peduncled heads of yellow flowers. Involucre broadly campanulate, its bracts about 8, equal, membranous, becoming concave after flowering. Receptacle flat, naked. Rays truncate and 5-toothed. Achenes obovoid, 8-10-ribbed, contracted at the base, rounded at the summit. Pappus none.

1. *Serinia oppositifolia* (Raf.) Kuntze. *SERINIA*. Glabrous throughout, or slightly glandular-pubescent along the ends of the peduncles, branched from the base, 4'-10' high. Basal and lower leaves petioled, oblong-lanceolate, or spatulate in outline, entire, lobed or pinnatifid, 3'-5' long. Upper leaves sessile, clasping, alternate, usually entire. Heads 1½"-2" broad.

In dry soil. March-May. Common.

II. *KRIGIA* Schreb.

Small, annual or perennial herbs. Leaves mostly basal, toothed or lyrate. Head of yellow flowers, solitary at the end of the scape. Involucre campanulate, in 2 series. Receptacle flat, naked. Rays truncate, 5-toothed. Achenes turbinate, 15-20-ribbed, truncate. Pappus in 2 series, the outer of 5 thin, broad, rounded scales, the inner of 10 or more slender naked bristles.

1. *Krigia virginica* (L.) Willd. *CAROLINA DWARF DANDELION*. Annual, acaulescent. Scapes several, 1'-15' high, becoming branched and leafy. Leaves all basal, spatulate, lanceolate or linear, pinnatifid, sinuate, lobed, dentate or rarely entire, 1'-6' long. Head 3"-7" broad.

In dry sandy soil. April-August.

III. *CYNTHIA* D. Don.

Perennial herbs, with tufted, basal leaves, the large, many-flowered heads at the ends of simple or branched scapes. Flowers orange or yellow. Bracts of the involu-

cre 9-18, reflexed in fruit, lanceolate to linear-lanceolate, not keeled. Pappus of 10-15 small scales and as many long bristles or more.

1. *Cynthia Dandelion* L. DWARF DANDELION. Perennial acaulescent, glabrous and somewhat glaucous. Scape 6'-18' high. Stolons filiform, bearing globose tubers. Leaves all basal, linear-lanceolate to spatulate, entire, denticulate, sinuate or pinnatifid, 3'-6' long. Head about 1' broad.

In moist soil. April-June. Frequent.

IV. *CYMBIA* (T. & G.) Standley.

An annual, acaulescent herb, the leaves forming rosettes, the scape monocephalous. Involucral bracts 5-8, ovate to ovate-lanceolate. Receptacle naked. Rays yellow, 5-toothed. Achenes turbinate, ribbed. Pappus an outer series of 5 obovate scales, and an inner series of 5 bristles, much longer than the scales.

1. *Cymbia occidentalis* (Nutt.) Standley. WESTERN DWARF DANDELION. Scapes tufted, 2'-8' high, usually glandular, sometimes glabrous, bearing a single head 5"-10" broad. Leaves basal, lanceolate to obovate, entire to pinnatifid.

Prairies. April-May. Oklahoma and Kingfisher counties.

V. *TRAGOPOGON* (Tourn.) L.

Biennial or perennial, somewhat succulent herbs, with fleshy tap-roots. Leaves alternate, entire, linear-lanceolate, long-acuminate, clasping at the base. Large heads of yellow or purple flowers. Involucre cylindric or narrowly-campanulate, its bracts in one series, acuminate, united at the base. Rays truncate, 5-toothed. Achenes linear, terete, or 5-angled, 5-10-ribbed, terminated by slender beaks. Pappus-bristles in one series, plumose, connate at the base, the plume-branches interwebbed.

1. *Tragopogon porrifolius* L. OYSTER PLANT or SALSIFY. Peduncles very much thickened and hollow for 1'-3' below the heads. Heads 2'-4' broad. Bracts of the involucre linear-lanceolate, acuminate, usually much longer than the purple rays.

In fields and waste places. April-October. Oklahoma County.

VI. LEONTODON L.

Perennial, acaulescent herbs. Leaves basal, tufted, pinnatifid, or sinuate-dentate. Large heads of yellow flowers, solitary at the ends of naked hollow scapes. Involucre oblong or campanulate, its inner bracts in 1 series of shorter, somewhat spreading ones. Receptacle flat, naked. Rays truncate, 5-toothed. Achenes oblong or linear-fusiform, 4-5-angled, 5-10 nerved, roughened or spinulose, at least above, tapering into a very slender beak. Pappus of numerous, filiform, unequal, simple, persistent bristles.

1. **Leontodon Taraxacum** L. DANDELION. Leaves coarsely pinnatifid, sinuate-dentate, rarely sub-entire. Heads 1'-2' broad, orange-yellow. Involucral bracts not glaucous, the outer elongated, conspicuously reflexed. Achene olive-green or brownish, bluntly muriculate above, its beak 2-3 times its length. Pappus white.

In fields and waste places. A bad weed in lawns. January-December. Common.

VII. SONCHUS (Tourn.) L.

Annual or perennial. Leaves mostly toothed or pinnately cut, prickly margined. Heads in corymbs or panicles. Bracts in several series, the outer shorter. Receptacles naked. Flowers yellow. Rays truncate, 5-toothed. Achenes oval to oblong, compressed, ribbed, truncate at the apex. Pappus of numerous soft, white hairs.

1. **Sonchus asper** (L.) Hill. SPINY SOW-THISTLE. Annual. Leaves lobed or sometimes pinnatifid, undivided, spinulose-dentate, the lower and basal ones obovate or spatulate, petioled, the upper oblong or lanceolate clasping by an auricled base. Heads 1'-broad or less. Flowers pale yellow.

In waste places. May-November. Common.

VIII. AGOSERIS Raf.

Acaulescent, perennial herbs with mostly narrow, entire, toothed, or pinnatifid basal leaves, and large scapose heads of yellow, orange, or purplish flowers. Involucre narrowly campanulate or cylindric, its bracts imbricated in several series, appressed, the outer successively shorter, herbaceous, not thickened. Achenes oblong or linear,

terete, 10-ribbed, beaked. Pappus of numerous simple white bristles.

1. *Agoseris cuspidata* (Pursh.) D. Dietr. PRAIRIE FALSE DANDELION. Leaves linear, pubescent or glabrate, 4'-8' long, their margins conspicuously white-tomentose and crisped, or entire. Scape tomentose. Head 1'-2' broad.

In dry soil. April-July. Frequent.

IX. SITILIAS Raf.

Annual or perennial, with alternate or basal leaves, and mostly large, solitary or few heads of yellow flowers, borne on long, usually bracted peduncles. Involucre oblong or campanulate, bracts in several series. Rays truncate, 5-toothed. Achenes oblong or fusiform, 5-ribbed, roughened or hirsute, abruptly narrowed into a long, filiform beak. Pappus of numerous soft, simple, brownish, somewhat unequal bristles, surrounded at the base by a villous white ring.

Stem leafy, usually branched; plant glabrous, or nearly so. 1. *S. caroliniana*.

Scape naked, monocephalous; plant hirsute, or pubescent. 2. *S. grandiflora*.

1. *Sitilias caroliniana* (Walt.) Raf. LEAFY-STEMMED FALSE DANDELION. Annual or biennial, glabrous or nearly so. Stem leafy, usually branched, 1°-3° high. Basal leaves oblong or oblong-lanceolate, pinnatifid, lobed, coarsely dentate or some of them entire, 3'-8' long. Stem-leaves sessile or partly clasping, the upper lanceolate, entire. Heads 1 or several, 1'-1½' broad.

In dry fields. April-July. Infrequent.

2. *Sitilias grandiflora* (Nutt.) Greene. ROUGH FALSE DANDELION. Hirsute or pubescent. Root tuberous-thickened. Leaves all basal, oblong or spatulate in outline, deeply pinnatifid, 3'-7' long. Scape naked or sometimes with a small leaf near its base. Heads solitary, 1'-2' broad.

On prairies. April-June. Common.

FAMILY 90. COMPOSITÆ. THISTLE FAMILY.

Herbs, rarely shrubs, with watery or resinous sap, and

opposite, alternate or basal, ex-stipulate leaves. Flowers perfect, pistillate, or neutral, or sometimes monœcious or diœcious, borne on a common receptacle, forming heads, subtended by an involucre of few to many bracts, arranged in one or more series. Receptacle naked, or with chaffy scales subtending the flowers. Calyx-tube completely adnate to the ovary, the limb (pappus) of bristles, awns, teeth, scales. Corolla tubular, usually 5-lobed or 5-cleft, or that of the marginal flowers expanded into a ligule (ray). Stamens usually 5, borne on the corolla and alternate with its lobes, their anthers united into a tube (syngenesious). Ovary 1-celled. Fruit an achene.

Artificial Key to Genera.

Rays yellow or red.

Receptacle chaffy.

Receptacle flat or slightly convex.

Pappus none, or of two caducous awns.

XII. Berlandiera.

Pappus a persistent irregular cleft crown.

XIII. Engelmannia.

Pappus of two short teeth or awns or mere border.

Bracts of the involucre all separate.

XVIII. Coreopsis.

Bracts of the involucre united to about the middle.

XIX. Thelesperma.

Receptacle convex or conic.

Achenes 4-angled.

XIV. Rudbeckia.

Achenes terete; leaves cordate-clasping.

XV. Dracopis.

Achenes compressed, winged.

XVI. Ratibida.

Achenes turbinate.

XXIV. Gaillardia.

Receptacle naked.

Receptacle convex.

Pappus of capillary bristles, leaves bristly-serrate.

I. Sideranthus.

Pappus of scales.

Bracts of the involucre appressed.

XXII. Tetraneuris.

Bracts of the involucre spreading or reflexed at maturity.

XXIII. Helenium.

Receptacle flat or nearly so.

XXVI. Senecio.

Rays white, pink or purplish.

Rays many.

Pappus present.

Pappus of a dentate crown, or short teeth.

Receptacle naked; achenes prismatic.

II. Aphanostephus.

Receptacle chaffy; achenes 4-sided.

XVII. Echinacea.

Pappus at least in part of awns or bristles.

Pappus of a few long awns or coarse bristles, or in ray-flowers reduced to palea.

IV. Townsendia.

Pappus of numerous, capillary bristles, at least on the disk achenes.

Involucre turbinate; bracts imbricated in several rows; rays white.

VI. Leucelene.

Involucres hemispheric or broad; bracts in 1-3 rows; rays white to purple.

VII. Erigeron.

Pappus none, or a ring of minute bristles.

III. Bellis.

Rays few.

Receptacle naked; achenes fusiform, terete; pappus of bristles and scales. **V. Chætopappa.**

Receptacle chaffy; achenes flat; pappus none.

XXV. Achillea.

Rays none.

Receptacle chaffy.

Pappus none.

IX. Filago.

Pappus of 2 retrorsely, hispid awns or scales.

XIX. Thelesperma.

Pappus of 5 or 6 acute or acuminate, ovate or lanceolate scales.

XX. Marshallia.

Pappus of 5 to 12 awned scales. **XXIV. Gaillardia.**

Receptacle naked.

Pappus of capillary bristles.

Plants dioecious or polygamo-dioecious.

Shrubs; leaves mostly toothed.

VIII. Baccharis.

Herbs; leaves entire.

X. Antennaria.

Plants not dioecious, flowers all fertile.

XI. Gnaphalium.

Pappus of thin obtuse scales.

XXI. Hymenopappus.

Receptacle bristly.

Leaves prickly.

XXVII. Cirsium.

Leaves not spiny.

XXVIII. Centaurea.

I. SIDERANTHUS Fraser.

Annual or perennial herbs with alternate, simple to pinatifid leaves and numerous, rather large heads of yellow flowers with yellow rays. Leaves small, toothed or pinatifid, sessile. Involucre campanulate, many-flowered, the

bracts with green tips, in several series, receptacle naked. Achenes obtuse, compressed, 8-10 nerved. Persistent pappus of 1 or more series of unequal, smooth or barbelate bristle.

1. *Sideranthus spinulosus* (Nutt.) Sweet. CUT-LEAVED SIDERANTHUS. Perennial by thick, woody roots, canescent or glabrate, much branched, 6'-15' high. Leaves pinnatifid, sessile, linear to ovate in outline, the lobes with bristle-pointed teeth. Heads several or numerous, 6"-12" broad. Involucre hemispheric, its bracts linear, acute, appressed. Rays narrow. Achenes pubescent. Pappus soft and capillary.

In dry soil. March-September. Kingfisher County.

II. APHANOSTEPHUS DC.

Slender, low, annuals or perennials, much branched, with entire to pinnatifid leaves, and pedunculate white-rayed heads. Bracts broadly lanceolate, well imbricated, receptacle conic or hemispheric. Achenes terete, truncate, with low, laciniate or ciliate pappus.

1. *Aphanostephus skirrobasis* (DC.) Trelease. APHANOSTEPHUS. Erect, or diffusely branched, densely canescent, 6'-24' high. Basal and lower leaves spatulate, somewhat dentate, laciniate or entire, narrowed into margined petioles. Upper leaves lanceolate to oblong, mostly sessile. Heads 8"-12" broad, 3"-5" high. Rays numerous, narrow, entire. Achenes ribbed and angled. Pappus a lobed or dentate crown.

In dry soil. May-August.

III. BELLIS (Tourn.) L.

Tufted herbs, with branching or scapose stems. Leaves alternate or basal. Heads of both tubular and radiate flowers. Involucre hemispheric, bracts herbaceous, imbricated in 1 or 2 series.* Receptacle convex or conic, naked. Ray flowers white or pink, pistillate. Disk-flowers yellow, perfect, tubular, 4-5 toothed. Achenes flattened, obovate, nerved near the margins. Pappus none, or a ring of minute bristles.

1. *Bellis intergrifolia* Michx. WESTERN DAISY. Diffusely branched, pubescent, 6'-15' high. Leaves entire, the lower and basal ones spatulate, 1'-3' long, narrowed into margined petioles, the upper

smaller, oblong, oblanceolate or linear. Heads 6"-15" broad. Bracts of the involucre acute or acuminate, scarious-margined, glabrous or nearly so. Rays usually violet, oblong-linear.

In moist soil. May-July. Oklahoma County and Arbuckle Mountains.

IV. TOWNSENDIA Hook.

Annual, biennial, or perennial herbs. Leaves alternate, entire, linear or spatulate. Heads of both tubular and radiate flowers. Involucre hemispheric, bracts imbricated in several series, the outer shorter. Receptacle nearly flat, naked or fimbriate. Ray-flowers pink or white, pistillate. Disk-flowers tubular, perfect, 5-lobed. Achenes of the disk-flowers compressed, those of the rays commonly 3-angled. Pappus a single series of rigid bristles or short scales.

1. *Townsendia exscapa* (Richards) Porter. LOW TOWNSENDIA. Acaulescent, or nearly so, from a deep, woody root, 1'-3' high. Leaves all clustered at the base, linear or slightly spatulate, 1'-2' long. Heads sessile, 1'-1½' broad, equaled or surpassed by the leaves. Involucre broadly campanulate. Rays white or purplish. Pappus a row of rigid bristles.

In dry soil. Wichita Mountains. April-July.

V. CHÆTOPAPPA DC.

Annual, slender, much-branched herbs. Leaves small, alternate, entire. Long peduncled heads of both tubular and white or purple, radiate flowers. Involucre campanulate, bracts imbricated in a few series, the outer shorter. Receptacle small, naked. Ray-flowers in 1 row, pistillate. Disk-flowers perfect, 5-lobed. Achenes nearly terete, fusiform, or linear, 5-ribbed. Pappus usually of 5 rigid, awn-like, scabrous bristles, alternating with as many short scales or more.

1. *Chætopappa asteroides* DC. CHÆTOPAPPA. Slender, 2'-12' high, the branches filiform. Lower and basal leaves spatulate, ½'-1' long, the upper linear, bractlike. Heads about 3" broad. Involucre about 2" high, its bracts scarious-margined. Rays 5-12, raised on slender tubes. Achenes pubescent.

In dry soil. Frequent. April-July.

VI. LEUCELENE Greene.

Low, perennial herbs. Leaves oblanceolate, linear, or subulate. Heads solitary at the ends of the branches. Involucre turbinate, bracts imbricated in several series. Ray-flowers pistillate and fertile, ligules white, turning reddish. Disk-flowers perfect, white, tubular-funnel-form, 5-toothed. Style-branches with ovate, obtuse appendages. Achenes long, flattened, hispidulous. Pappus a single series of slender, rough, white bristles.

1. *Leucelene ericoides* (Torr.) Greene. ROSE HEATH ASTER. Stems tufted from deep, woody roots, corymbosely branched, 3'-12' high, hispid or scabrous. Leaves hispid-ciliate, erect or slightly spreading, the lower and basal ones spatulate, 3"-6" long, the upper sessile, linear, or linear-spatulate. Heads terminating the branches, 5"-8" broad. Involucre broadly turbinate, its bracts appressed, scarious-margined, imbricated in 3 or 4 series. Rays 12-15, white or rose, 2"-4" long.

In dry soil. May-August.

VII. ERIGERON L.

Branching or scapose herbs. Leaves alternate or basal. Heads corymbose, paniculate, or solitary, of tubular and radiate flowers. Involucre hemispheric or saucer-shaped, bracts imbricated in but one or two series. Receptacle nearly flat, naked. Ray-flowers white, violet or purple, pistillate. Disk-flowers yellow, perfect, 5-lobed. Achenes flattened, usually 2-nerved. Pappus-bristles fragile, slender, scabrous, in 1 series, or often an additional outer short series.

Rays 100-150, narrow, mostly purple or violet.

Pappus simple; plant erect, corymbosely branched.

1. *E. philadelphicus*.

Pappus double; plant diffusely branched, western.

2. *E. divergens*.

Rays much less numerous, purplish or white.

Plants 5'-12' high, diffuse, western; pappus simple.

3. *E. Bellidiastrum*.

Plants 6'-3° high, erect, branched; pappus double.

Pappus of the ray-flowers and disk-flowers unlike.

Stem leaves lanceolate, nearly all sharply serrate. 4. *E. annuus*.

Stem leaves linear-lanceolate or oblong, nearly all entire. 5. *E. ramosus*.

Pappus of the ray-flowers and disk-flowers alike; plant hirsute. 6. *E. tenuis*.

1. **Erigeron philadelphicus** L. PHILADELPHIA FLEABANE. Perennial by stolons and offsets, slightly pubescent, 12'-36' high. Basal and lower leaves spatulate or obovate, dentate, 1'-3' long. Upper stem leaves clasping, dentate, or entire. Heads corymbose-paniculate, 5"-12" broad. Peduncles thickened at the summit. Rays 100-150, 2"-4" long, light rose, purple, to pinkish. Achenes puberulent.

In fields and woods. April-August. Common.

2. **Erigeron divergens** T. & G. SPREADING FLEABANE. Annual or biennial, 6'-15' high, densely cinereous-pubescent or hirsute. Basal and lower leaves spatulate or oblanceolate, entire, dentate or lobed, 1'-2' long, the upper sessile, linear. Heads 8"-12" broad. Involucre hemispheric. Rays about 100, purplish, violet, or nearly white, 2"-4" long. Pappus double, the shorter outer row of bristles subulate.

In moist soil. April-September.

3. **Erigeron Bellidiastrum** Nutt. WESTERN DAISY FLEABANE. Annual, 6'-15' high, cinerous-pubescent throughout. Leaves entire, linear, spatulate, the lower petioled, 1'-1½' long, the upper sessile, and smaller. Heads 5"-8" broad. Rays 30-65, purplish, about 2" long. Pappus a single series of capillary bristles.

In moist soil. May-July. Kingfisher and Oklahoma Counties.

4. **Erigeron annuus** (L.) Pers. SWEET SCABIOUS. DAISY FLEABANE. Annual, pubescent with spreading hairs. Stem stout, 1°-4° high. Leaves coarsely and sharply toothed, the lowest ovate, the upper ovate-lanceolate. Heads corymbd. Rays white, tinged with purple. Pappus double, the inner a series of slender bristles, the outer short, slender scales.

Fields. May-November. Payne County.

5. **Erigeron ramosus** (Walt.) B. S. P. DAISY FLEABANE. Resembling No. 4, but lower, with appressed pubescence. Stem leaves linear-oblong or linear-lanceolate, nearly all entire. Basal and lowest spatulate or oblong, usually serrate. Bracts of the involucre nearly glabrous. Rays white or sometimes purplish.

In meadows and prairies. Common. July-August.

6. **Erigeron tenuis** T. & G. SLENDER ROUGH FLEABANE. Annual or biennial. Branched from the base, strigose-pubescent. Stems

12'-high or less. Basal leaves obovate to spatulate, 1'-1½' long, usually toothed. Stem leaves linear to linear-oblong, toothed or entire. Heads 7"-10" broad. Rays white or purplish, numerous. Pappus of ray-flowers and disk-flowers alike, of few long bristles and short small scales.

Moist prairies and plains. April-May. Kingfisher County.

VIII. BACCHARIS L.

Dioecious shrubs or herbs. Leaves alternate. Heads of tubular flowers, paniculate or corymbose. Involucre campanulate, bracts imbricated in several series, the outer shorter. Receptacle flat, naked, commonly foveolate. Corolla of the pistillate flowers slender, that of the staminate tubular, 5 lobed. Style-branches of the sterile flowers rudimentary, tipped with an ovate, pubescent appendage. Achenes more or less compressed, ribbed. Pappus of the fertile flowers copious, capillary, that of the sterile flowers short.

1. *Baccharis salicina* T. & G. WILLOW BACCHARIS. A glabrous much-branched shrub, 3°-6° high, the branches ascending. Leaves oblong-lanceolate, more or less 3-nerved, mostly obtuse at the apex, narrowed into a cuneate base, 12"-18" long, repand-dentate or entire. Heads in clusters of 1-9. Pappus usually but a single series of nearly white capillary bristles.

Frequent along rivers. May-July.

IX. FILAGO Loefl.

White-woolly annual herbs. Leaves alternate, entire. Heads small, discoid, clustered, usually subtended by leafy bracts. Bracts of the involucre few and scarious. Receptacle convex, chaffy. Outer flowers of the heads in several series, pistillate, fertile. Central flowers few, perfect, mainly sterile. Achenes compressed or terete. Pappus none.

1. *Filago prolifera* (Nutt.) Britton. FILAGO. Stem simple or branched at the base, very leafy, 2'-6' high. Leaves spatulate, sessile, 4"-8" long. Heads in a sessile, leafy-bracted cluster. Receptacle convex. Chaff of the central sterile flowers woolly-tipped, that of the fertile flowers scarious, mostly glabrous.

In dry soil. April-July. Common.

X. ANTENNARIA Gærtn.

Perennial, white, woolly herbs. Leaves mostly basal, broad, entire. Heads corymbose or racemose. Heads many-flowered, diœcious, the flowers all tubular. Involucre dry, scarious, white or colored, imbricated. Receptacle naked. Achenes terete or flattish. Pappus a single row of bristles, in the fertile flowers capillary, in the staminate ones clavellate-thickened at the tips.

Basal leaves large, mostly 2'-5' long, mostly 10" wide or wider, oblong to obovate, 3-5-nerved.

1. *A. plantaginifolia*.

Basal leaves small, 2'-long or less, spatulate to oblanceolate or obovate, mostly 1-nerved.

2. *A. campestris*.

1. **Antennaria plantaginifolia** (L.) Richards. PLANTAIN-LEAF EVERLASTING. Floccose woolly, stoloniferous, forming broad patches. Flowering stems of fertile plant 4'-20' high. Sometimes with glandular hairs. Basal leaves obovate, spatulate or broadly oval, distinctly 3-ribbed, dull dark-green and cobwebby above, silvery beneath. Stem leaves sessile, oblong or lanceolate. Heads in corymbose or often subcapitate clusters, 4"-5" broad. Involucral bracts, greenish-white, linear to lanceolate. Achenes minutely glandular. Sterile plant smaller, 3'-8' high.

In dry soil. April-June. Common.

2. **Antennaria campestris** Rydb. PRAIRIE CAT'S FOOT. Stolons short, leafy. Flowering stems of both fertile and sterile plants 2'-6' high. Basal leaves obovate-cuneate, white-tomentose beneath, glabrate above, 1-nerved or indistinctly 3-nerved. Stem-leaves small, linear. Heads 3"-4" broad, in sub-capitate clusters. Bracts of the fertile heads lanceolate. Bracts of the sterile heads elliptic.

On dry prairies. May-June. Lincoln County.

XI. GNAPHALIUM L.

Woolly, erect, or diffusely-branched herbs. Leaves alternate. Heads discoid, in corymbs, spikes, racemes, or capitate. Receptacle flat, convex or conic. Pistillate flowers in several series. Central flowers perfect, tubular, few. Achenes oblong or obovate, terete or slightly compressed, not ribbed. Pappus a single series of capillary bristles.

1. **Gnaphalium purpureum** L. PURPLISH CUDWEED. Annual or

biennial, 2'-24' high. Leaves spatulate, or the uppermost linear, mucronulate, woolly beneath, glabrous or nearly so above. Heads 2"-2½" high in a terminal, sometimes leafy, spike. Bracts of the involucre yellowish-brown or purplish, lanceolate-oblong. Pappus-bristles united below. Achenes roughish.

In dry, sandy soil. May-September. Oklahoma County.

XII. BERLANDIERA DC.

Perennial, canescent, or pubescent herbs. Leaves alternate, simple or lyrate-pinnatifid. Heads large, pedunculate, with showy, yellow rays. Bracts imbricated in about 3 series, the outermost small, oblong, the second series oval or obovate, the inner membranous. Receptacle nearly flat, chaffy. Ray-flowers 5-12, pistillate, fertile. Disk-flowers perfect, tubular, sterile. Achenes obovate, compressed, not winged. 1-ribbed on the inner side. Pappus obsolete, early deciduous or of 2 caducous awns.

1. *Berlandiera lyrata* Benth. LYRE-LEAVED BERLANDIERA. Finely whitish-canescant, acaulescent or short-stemmed. Scapes or peduncles 3'-8' long, bearing a solitary head, or rarely 2. Leaves lyrate-pinnatifid, lobes mostly crenate. Heads about 1'-broad. Inner bracts of the involucre much broader than the outer, orbicular. Achenes obovate, keeled on the inner face.

In dry soil. May-August. Frequent.

XIII. ENGELMANNIA T. & G.

Perennial, hirsute herbs. Leaves alternate, pinnatifid. Heads large, corymbose, with yellow rays. Involucre hemispheric. Bracts imbricated in two or three series, the outer linear, loose, hirsute, ciliate, the inner oval or obovate, appressed. Receptacle flat, chaffy. Rays 8-10, pistillate, fertile. Disk-flowers about as many, perfect, sterile. Achenes obovate, compressed, not winged, 1-ribbed on each face. Perhaps a persistent, irregularly cleft crown.

1. *Engelmannia pinnatifida* T. & G. ENGELMANNIA. Stem 1°-3° high. Basal leaves slender petioles, 4'-8' long, their lobes lanceolate or oblong, dentate or entire. Upper leaves smaller, sessile, the uppermost sometimes entire, or with a pair of basal lobes. Heads usually numerous, about 1' broad. Outer bracts of the involucre somewhat in 2 series, the first linear, the second broadened at the base.

In dry soil. May-August. Frequent.

XIV. RUDBECKIA L.

Perennial or biennial. Leaves alternate, entire or lobed. Heads radiate, long-peduncled, many-flowered. Bracts imbricated in 2-3 series, spreading. Receptacle convex or long-conical, with concave, chaffy scales. Ray-flowers yellow, neutral. Disk-flowers purple to brown, bi-sexual. Achenes smooth 4-angled, truncate. Pappus a few short teeth or wanting.

1. **Rudbeckia hirta** L. BLACK EYED SUSAN. Biennial or sometimes annual, hirsute or hispid throughout. Stems 1°-3° high. Leaves sparingly serrate with low teeth, or entire, lanceolate or oblong 3 to 5 nerved. Heads commonly few or solitary, 2'-4' broad. Rays 10-20, orange or orange-yellow. Bracts of the involucre very hirsute, spreading or reflexed. Disk globose-ovoid, purple-brown. Chaff of the receptacle linear, hirsute at the apex. Pappus none.

Prairies and plains. May-September. Common.

XV. DRACOPIS Cass.

An annual, caulescent herb, with smooth and glaucous foliage, and alternate broad, thickish, entire or slightly serrate, 1-ribbed, clasping leaves. Involucre flat, of few, narrow, foliaceous bracts. Receptacle slender, with early, deciduous, chaffy scales. Ray-flowers few, neutral, yellow. Disk flowers perfect, fertile, brownish. Achenes terete or nearly so, not angled, striate and transversely wrinkled. Pappus wanting.

1. **Dracopis amplexicaulis** (Vahl.) Cass. CLASPING-LEAVED CONE-FLOWER. Annual. Glabrous throughout, somewhat glaucous. Stem branched grooved, 12'-24' high. Leaves entire or sparingly toothed, 1-ribbed, reticulate-veined, the lower oblong to spatulate, sessile, the upper ovate or lanceolate, cordate-clasping. Heads solitary, about 2' broad. Bracts of the involucre few, lanceolate. Rays yellow, or sometimes brown at the base. Disk ovoid-oblong, often becoming 1' high.

In wet soil. May-August. Common.

XVI. RATIBIDA Raf.

Perennial herbs. Leaves alternate, pinnately divided. Heads radiate, long-peduncled, many-flowered. Involucral bracts in 2 or 3 series. Disk globose. Receptacle columnar

to subulate, the chaff of concave, truncate scales. Ray-flowers yellow or with brown at the base, neutral. Disk-flowers perfect, fertile, usually grayish. Achenes short, flattened, sharp-margined, or winged. Pappus with 1 or 2 teeth, or none.

1. *Ratibida columnaris* (Sims.) D. Don. PRAIRIE CONE-FLOWER. Strigose, pubescent, and scabrous. Stem 12'-30' high. Leaves pinnately divided into linear or linear-oblong, entire, dentate or cleft segments. Bracts of the involucre short, linear-lanceolate or subulate, reflexed. Rays 4-10, yellow, brown at the base, or brown all over, 4"-15" long, drooping. Disk gray, elongated-conic or cylindric. Chaff or the receptacle canescent at the apex. Pappus of 1 or 2 subulate teeth, usually with several, short, intermediate scales. On dry prairies. May-August. Common.

XVII. ECHINACEA Moench.

Perennial, erect, branched, or simple herbs, with thick, black roots. Leaves rough, alternate, or opposite, 3-5-nerved entire or dentate. Heads large, long-peduncled, the rays purple, purplish, crimson or yellow, the disk green or purple, ovoid. Involucre depressed-hemispheric, bracts lanceolate, spreading or appressed, imbricated in 2-4 series. Receptacle conic, chaffy. Ray flowers neutral. Disk-flowers perfect. Achenes 4 sided, obpyramidal. Pappus a short, dentate crown.

Rays about 1' long, spreading.

1. *E. angustifolia*.

Rays 1½'-3' long, drooping.

2. *E. pallida*.

1. *Echinacea angustifolia* DC. NARROW-LEAVED PURPLE CONE-FLOWER. Stem hispid or hirsute, 12'-24' high. Leaves lanceolate or linear-lanceolate, hirsute, strongly 3-nerved, entire, 3'-8' long. Rays usually 10-12, purplish or white, spreading, 10"-12" long.

In dry soil. May-October. Infrequent.

2. *Echinacea pallida* (Nutt.) Britton. PALE PURPLE CONE-FLOWER. Similar to preceding species, but often taller. Leaves elongated-lanceolate or linear-lanceolate, entire. Rays narrow, linear, drooping, 1½'-3' long, rose purple or nearly white.

In dry soil on prairies. May-July. Frequent.

XVIII. COREOPSIS L.

Annual or perennial herbs. Leaves opposite or the upper

alternate, entire or pinnately divided. Heads radiate, solitary or corymbed, many-flowered. Bracts in 2 rows of about 8 each, the inner membranous and appressed, the outer narrower and spreading. Receptacle chaffy. Ray-flowers neutral. Disk flowers perfect, fertile. Achenes compressed, oval to oblong, often winged. Pappus of 2 scales or bristles, or wanting.

Style-tips acute or cuspidate; outer involucre bracts about as long as the inner. 1. *C. grandiflora*.

Style-tips truncate or obtuse; outer involucre bracts much shorter than the inner. 2. *C. tinctoria*.

1. **Coreopsis grandiflora** Hogg. LARGE-FLOWERED TICKSEED. Perennial. Stem glabrous, 1°-3° high. Leaves 1-2 pinnately parted, or the lower entire. Heads commonly several, 1'-2' broad. Outer bracts of the involucre lanceolate, inner ones oval or ovate-lanceolate. Rays 6-10, yellow, lobed. Achenes broadly winged when mature. Pappus of 2 short scales.

In dry soil. May-August. Frequent.

2. **Coreopsis tinctoria** Nutt. GOLDEN COREOPSIS. Annual. Stem glabrous, 1°-3½° high. Leaves 1-2 pinnately divided into linear, mostly entire segments. Heads 10"-12" broad. Involucre hemispheric, its inner bracts brown. Rays 6-10, cuneate, yellow with a brown base, or brown all over. Pappus a mere border, or none.

In moist soil. May-September. Common.

XIX THELESERMA Less.

Glabrous, annual or perennial herbs. Leaves opposite, linear, and undivided, or finely dissected. Heads long-peduncled, rays sometimes wanting. Involucre campanulate, of two distinct series of bracts, the outer short, narrow and somewhat spreading, the inner united nearly to or beyond the middle into a cup, their tips scarious-margined. Receptacle flat, chaffy. Ray-flowers, when present, neutral, rays yellow. Disk flowers perfect, fertile. Achenes papillose on the back, oblong or linear, slightly compressed or terete, wingless. Pappus of two retrorsely hispid awns or scales.

Rays large; pappus-awns shorter than the width of the achene.

1. *T. trifidum*.

Rays inconspicuous, or none; awns longer than the width of the achene; perennial. 2. *T. gracile*.

2. **Thelesperma trifidum** (Poir.) Britton. FINE-LEAVED THELESPERMA. Annual or biennial. Stem 1°-3° high. Leaves numerous, bi-pinnately divided into filiform segments. Heads several or numerous, 12"-15" broad. Outer bracts of the involucre about 8, subulate-linear, equaling or more than half as long as the inner, which are united not higher than the middle. Rays 6-10, somewhat spatulate, 3-lobed. Disk purple or brown.

In dry soil. May-August. Frequent.

3. **Thelesperma gracile** (Torr.) A. Gray. RAYLESS THELESPERMA. Perennial from a deep root. Stem 1°-3° high. Leaves pinnately or bi-pinnately divided into linear segments. Heads 6"-10" broad. Rays usually none. Outer bracts of the involucre 4-6, oblong or ovate, very much shorter than the inner ones, which are united to the middle or beyond. Disk yellow or brownish.

On dry plains. May-August. Harmon County.

XX. MARSHALLIA Schreb.

Perennial, often tufted, simple or branched herbs. Leaves basal or alternate, entire. Heads large, long-peduncled, discoid, of purple, pink or white, glandular-pubescent flowers. Involucre broadly campanulate, bracts in 1 or 2 series, nearly equal. Receptacle convex, chaffy. Rays none. Flowers all perfect and fertile, their corollas with a deeply 5-lobed or 5-parted campanulate limb and a slender tube. Achenes turbinate, 5-ribbed and 5-angled. Pappus of 5 or 6 acute or acuminate, ovate or lanceolate-deltoid, nearly entire scales.

1. **Marshallia caespitosa** Nutt. NARROW-LEAVED MARSHALLIA. Stems usually tufted and simple, 8'-15' high. Leaves thick, mostly basal, faintly 3-nerved, linear or linear-spatulate. Head about 1' broad, borne on a peduncle often 10' long. Corollas pale rose or white. Bracts of the involucre linear-lanceolate.

Prairie and hills. May-June. Infrequent.

XXI. HYMENOPAPPUS L'Her.

Perennial or biennial, erect herbs, with angled stems. Leaves alternate or basal, mostly pinnatifid or dissected. Heads discoid, corymbose or solitary, of white or yellow flowers. Involucre hemispheric, bracts 6-12 in 1 or 2 series, mostly appressed, colored, petal-like. Receptacle small,

naked. Rays none. Disk-flowers all perfect and fertile. Achenes obovoid or obpyramidal, 4-5 angled, the faces usually prominently 1-3 nerved. Pappus of 10-20 thin obtuse scales.

Bracts of the involucre broadly ovate or oval, bright white.

1. *H. carolinensis*.

Bracts obovate to oblong, green or with white tips.

2. *H. tenuifolius*.

1. **Hymenopappus carolinensis** (Lam.) Porter. WHITE-BRACTED HYMENOPAPPUS. Biennial. Stem wholly pubescent or glabrate. Leafy below, corymbosely branched, 2°-3° high. Basal and lower leaves 1-2-pinnately parted or deeply pinnatifid into linear or oblong lobes, more or less white tomentose beneath. Upper leaves less divided. Heads commonly numerous, corymbose, 6"-10" broad. Bracts of the involucre oblong, ovate, white, puberulent or glabrate. Corolla white.

In dry sandy soil. April-June. Common.

2. **Hymenopappus tenuifolius** Pursh. WOOLLY WHITE HYMENOPAPPUS. Biennial. Stem slightly tomentose, 12'-24' high. Lower and basal leaves 1-3 pinnately parted into linear, filiform lobes, woolly pubescent beneath, at least when young. Upper leaves much smaller and less compound. Heads numerous, corymbose, 4"-6" broad. Corolla white. Achenes densely villous, pubescent. Pappus of several ribbed scales.

On dry prairies. May-September. Common.

XXII. TETRANEURIS Greene.

Usually scapose, annual or perennial herbs with mostly basal, entire, often punctate leaves and long-pedunculate heads. Disk-flowers and rays bright yellow. Involucre hemispheric, of 2 or 3 series of similar, appressed, imbricated bracts. Receptacle convex or conic, naked. Achenes turbinate, 5-10 ribbed or angled, variously pubescent. Pappus of 5-12 scarious, aristate, truncate or acuminate scales.

Stem leafy, branching; stem leaves linear; annual or biennial.

1. *T. linearifolia*.

Stems tufted, simple, scapose; leaves basal; perennials.

2. *T. stenophylla*.

1. **Tetranneuris linearifolia** (Hook.) Greene. FINE-LEAVED TETRANEURIS. Annual or biennial. Stem slender 6'-15' high.

Stem leaves narrowly linear, $\frac{1}{2}$ '-1 $\frac{1}{2}$ ' long. Basal leaves spatulate. Heads numerous, 6"-8" broad. Rays 6-10, oblong. Achenes pubescent. Pappus of 5 or 6 ovate awned scales.

In dry soil. May-September. Common.

2. *Tetraneuris stenophylla* Rydb. NARROW-LEAVED TETRANEURIS. Perennial, with a branched caudex. Bases of the leaves dilated, sparingly silky-villous. Blades narrowly linear, 1'-1 $\frac{1}{4}$ ' long, glabrous, punctate. Scape 2'-4' high, minutely strigose. Rays about 5" long.

In dry soil. May-August. Harmon county.

XXIII. HELENIUM L.

Annual, biennial or perennial caulescent herbs. Leaves alternate, entire or toothed, often decurrent on the stem. Heads radiate or rarely discoid, peduncled. Involucre flat-tish, bracts in 1 or 2 series, linear or subulate, reflexed or spreading. Receptacle convex, sub-globose or oblong, naked. Ray-flowers pistillate and fertile, or neutral. Disk-flowers perfect, fertile 4-5-toothed, the teeth glandular-pubescent. Achenes turbinate, ribbed. Pappus of 5-8 entire, dentate or incised, acuminate or aristate scales.

Disk yellow; leaves with entire blades.

1. *H. tenuifolium*.

Disk purple brown; some of the lower cauline leaves with pinnately-parted blades.

2. *H. badium*.

1. *Helenium tenuifolium* Nutt. FINE-LEAVED SNEEZEWEED. Annual. Glabrous or pubescent above. Stem very leafy and usually much branched, 8'-24' high. Leaves all linear, filiform, entire, sessile. Heads numerous, corymbose, 9"-15" broad. Rays 4-8, fertile, 3-4-toothed, at length drooping. Achenes villous. Pappus scales ovate tipped with slender awns.

In dry or moist soil. May-October. South and eastern part of state.

2. *Helenium badium* (A. Gray) Greene. SNEEZEWEED. Similar to *H. tenuifolium* in habit, but usually more slender, the lower cauline and basal leaves, or some of them, pinnately parted into slender segments. Disk purplish brown.

In dry soil. May-August. Southwestern part of the state.

XXIV. GAILLARDIA Foug.

Annual, biennial or perennial, scapose or caulescent

herbs with pubescent foliage. Leaves alternate or basal, entire, toothed or pinnatifid. Heads radiate, long-peduncled. Involucre depressed-hemispheric, bracts imbricated in 2 or 3 series, their tips spreading or reflexed. Receptacle convex or globose, bristly, fimbriate or nearly naked. Rays cuneate, yellow, purple or parti-colored, neutral. Disk-flowers perfect, fertile, 5-toothed, the teeth pubescent with jointed hairs. Achenes turbinate, 5-ribbed, densely villous. Pappus of 6-12, 1 nerved awned scales.

Stem leafy; style tips with filiform, hispid appendages.

Rays yellow; fimbriæ exceeding the achenes.

1. *G. aristata*.

Rays purple, or red at base; fimbriæ about equaling the achenes.

2. *G. pulchella*.

Leaves basal; style-tips with short, naked appendages; rays none, or few.

Leaf-blades pinnately veined and pinnatifid.

3. *G. suavis*.

Leaf-blades 3-ribbed, merely toothed. 4. *trinervata*.

1. **Gaillardia aristata** Pursh. GREAT-FLOWERED GAILLARDIA. Perennial. Stem hirsute or densely pubescent, with jointed hairs. 1°-3° high. Leaves densely and finely pubescent, the lower and basal ones oblong or spatulate, laciniate, pinnatifid or entire. Upper leaves lanceolate or oblong, entire or dentate. Heads 1½'-4' broad. Rays 10-18, yellow. Fimbriæ of the receptacle mostly longer than the achenes.

On plains and prairies. May-September. Frequent.

2. **Gaillardia pulchella** Foug. SHOWY GAILLARDIA. Annual, stem 6'-24' high, hirsute or pubescent, with jointed hairs. Leaves lanceolate, oblong, or the lower spatulate, entire, dentate or sinuate-pinnatifid. Heads 1'-3' broad. Rays 10-20, red or purple at the base, yellow toward the apex. Fimbriæ of the receptacle equaling or scarcely longer than the achenes.

In dry soil. May-September. Frequent.

3. **Gaillardia suavis** (A. Gray) Britton and Rusby. RAYLESS GAILLARDIA. Annual or biennial. Leaves in a basal tuft, pinnatifid, dentate, or some of them entire. Scape 12'-24' high, monocephalous. Head about 1' broad with the odor of heliotrope, globose in fruit. Rays none. Fimbriæ of the receptacle obsolete.

Pappus scales broad, their awns very slender.

In dry soil. April-June. Common.

4. **Gaillardia trinervate** Small. RAYLESS GAILLARDIA. Similar to *G. suavis* in habit. Leaves spatulate or oblong-spatulate, merely toothed, 3-ribbed. Scape closely pubescent under the head. Involucral bracts reflexed. Rays none.

In dry soil. April-June. Frequent.

XXV. **ACHILLEA** (Vaill.) L.

Perennial. Leaves alternate, pinnately divided. Heads with ray flowers in a terminal corymb. Involucral bracts imbricated in several series, the outer shorter. Receptacle chaffy. Ray-flowers white or pink, pistillate and fertile. Disk-flowers bi-sexual, tubular, 5-lobed. Achenes oblong, compressed, slightly margined. Pappus none.

Plant loosely woolly or nearly glabrous; inflorescence flat-topped. 1. *A. Millefolium*.

Plant densely woolly; inflorescence convex. 2. *A. lanulosa*.

1. **Achillea Millefolium** L. YARROW. Perennial. Flowering stems pubescent or nearly glabrous, 12'-24' high. Basal leaves mostly petioled, sometimes 10' long, and finely dissected into narrow, pinnatifid segments, tomentose, pubescent or nearly glabrous. Heads numerous, 2"-3" broad, in terminal compound corymbs. Rays 4-6, white, or often pink or purple, less than 2" broad.

On prairies. May-November. Common.

2. **Achillea lanulosa** Nutt. WOOLLY YARROW. Similar to the preceding species, 1°-2½° high, densely silky-woolly nearly all over. Leaves deeply bi-pinnatifid into narrow lobes and segments. Inflorescence convex, 2'-4' broad. Involucral bracts greenish-yellow, with brownish margins. Rays 1"-2½" broad, white.

In dry soil. May-September. Common.

XXVI. **SENECIO** (Tourn.) L.

Annual or perennial herbs. Leaves alternate or basal. Heads many flowered, solitary, corymbose or paniculate, yellow. Involucre cylindric or campanulate, bracts in 1 series, distinct, or united at the base, usually with some shorter, outer ones. Receptacle flat, naked. Rays, when present, pistillate, fertile. Disk-flowers perfect, fertile, 5-toothed or 5-lobed. Achenes terete or compressed, 5-10-ribbed, papillose or canescent. Pappus of numerous, slender or capillary, smooth or rough, mostly white bristles.

Annual or biennial species, with stems leafy throughout.

1. *S. glabellus*.

Perennial species, mostly with rootstocks.

Leaves and stems more or less persistently woolly or tomentose.

2. *S. plattensis*.

Plants glabrous, or nearly so, at least when mature, the stem sometimes at the base.

3. *S. obovatus*.

1. **Senecio glabellus** Poir. CRESS-LEAVED GROUNDSEL. Annual, glabrous throughout, fleshy and tender. Stem hollow, 1°-3° high. Leaves pinnately divided, the segments sinuate-dentate, entire or lobed. Heads numerous, 7"-10" broad, in terminal corymbs. Rays 6-12. Achenes minutely hispidulous on some of the angles. Pappus white, somewhat longer than the involucre.

In moist soil. April-September. Infrequent.

2. **Senecio plattensis** Nutt. PRAIRIE RAGWORT. Perennial, more or less tomentose, or becoming glabrate in age, seldom over 18' high. Basal leaves oval, ovate or oblong, more or less pinnatifid, crenulate or dentate, long-petioled. Stem leaves smaller and usually pinnatifid. Heads several or numerous, corymbose.

Dry soil. April-June. Common.

3. **Senecio obovatus** Muhl. ROUND-LEAF SQUAW-WEED. Perennial. Stems glabrous, or a little woolly at the base, 9'-24' high. Leaves glabrous, the basal ones obovate with a cuneate base, broadly spatulate, crenate-dentate, often purplish. Stem leaves spatulate to oblong, often incised or pinnatifid. Heads several, corymbose, 6"-8" broad. Rays 8-12. Achenes glabrous. Pappus white.

In moist soil. April-June. Turner Falls.

XXVII. CIRSIIUM (Tourn.) Mill

Erect, branching or simple, prickly herbs. Leaves alternate or basal, sinuate-dentate, lobed or pinnatifid, usually very spiny. Heads large, many-flowered, solitary or clustered, of purple, yellow, or white, tubular, perfect, and fertile, or, rarely, diœcious flowers. Involucre ovoid, or globose, bract prickly-tipped or unarmed, imbricated in many series. Receptacle flat or convex, bristly. Achenes obovate or oblong, compressed or obtusely 4-angled, glabrous, smooth or ribbed. Pappus of several series of slender, plumose bristles, connate at the base.

Leaves glabrous or hispid above, tomentose beneath.

1. *C. virginianum*.

Leaves tomentose on both sides, or becoming glabrous above; western.

2. *C. ochrocentrum*.

1. *Cirsium virginianum* (L.) Michx. VIRGINIA THISTLE. Biennial. Stem slender, naked or scaly above, pubescent or somewhat tomentose, 2°-3½° high. Leaves oblong, oblong-lanceolate, or the lowest slightly spatulate, sessile, or somewhat clasping, spinulose-margined, entire, lobed or pinnatifid into triangular-lanceolate lobes, the lower pubescent or glabrate above, and densely white-tomentose beneath. Heads 1'-1½' broad, about 1' high. Outer bracts tipped with weak, short bristles, the inner merely acuminate. Flowers purple.

In dry woods and thickets. April-September. Common.

2. *Cirsium ochrocentrum* A. Gray. YELLOW-SPINED THISTLE. Biennial, persistently and densely white-tomentose throughout, or the upper surfaces of the leaves at length green and glabrous. Stem leafy, often 6° high. Leaves usually very deeply pinnatifid into triangular-lanceolate, serrate or entire segments, armed with numerous long, yellow prickles. Heads about 2' broad, 1½'-2' high, solitary at the ends of the branches. Outer bracts tipped with stout, yellow prickles, the inner long-acuminate. Flowers purple (rarely white).

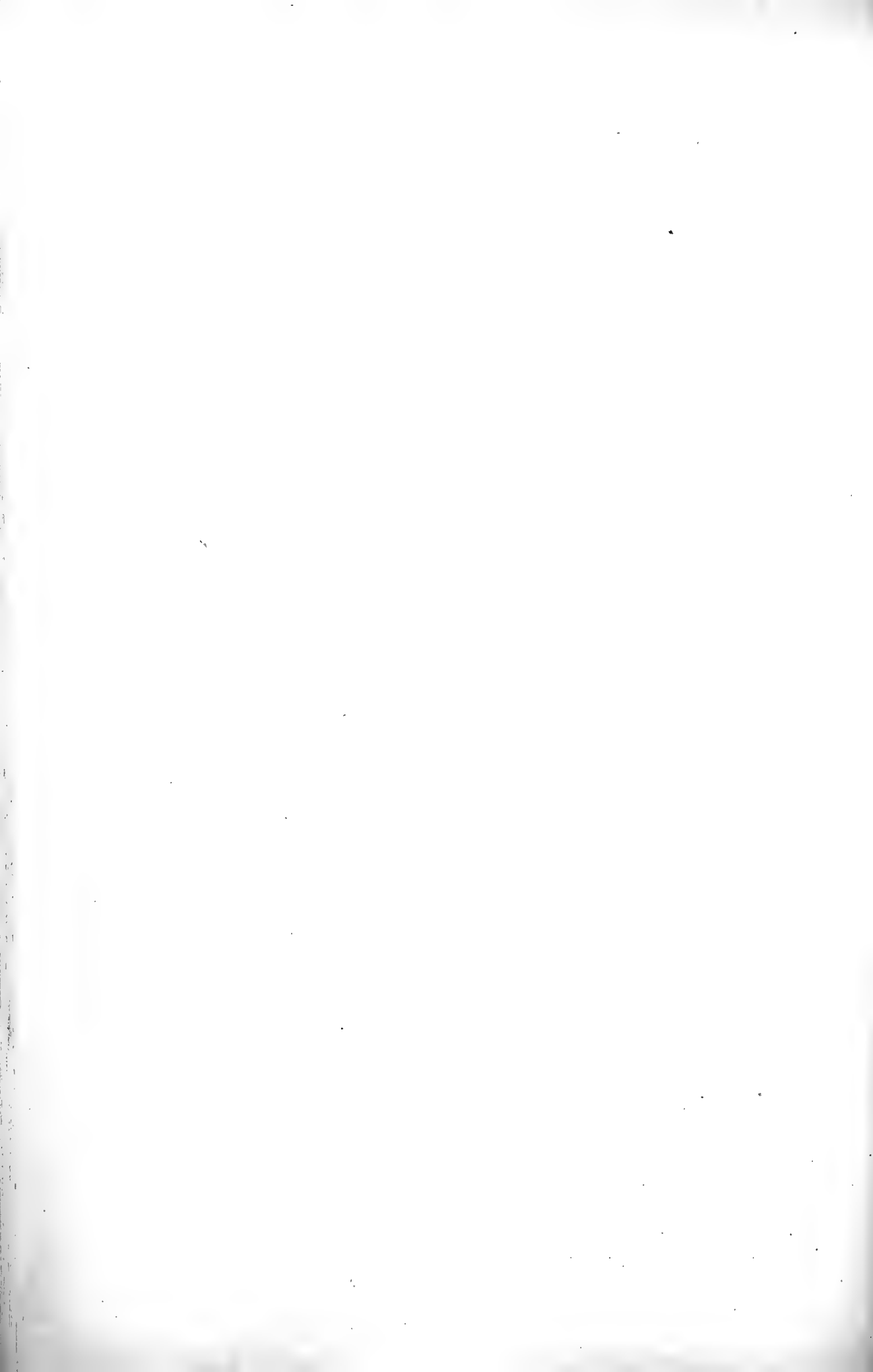
On plains. May-September. Infrequent.

XXVIII. CENTAUREA L.

Perennial or annual herbs. Leaves alternate, entire, dentate, incised or pinnatifid. Heads large or middle-sized, of tubular, purple, violet, white, or rarely, yellow flowers. Involucre ovoid or globose, bracts imbricated in many series, appressed, fimbriate, or dentate. Receptacle flat, densely bristly. Marginal flowers usually neutral and larger than the central ones, which are perfect and fertile. Corolla-tube slender, the limb regular or oblique, 5-cleft or 5-lobed, the segments sometimes appearing like rays. Achenes oblong or obovoid. Pappus of several series of bristles or scales.

L 1. *Centaurea americana* Nutt. AMERICAN STAR THISTLE. Annual, roughish. Stem 2°-6° high. Leaves entire or denticulate, the lower and basal ones spatulate or oblong, the upper oblong-lanceolate, mucronate. Heads solitary at the ends of the leafy branches, very showy, 2'-4' broad. The involucre bracts ovate or lanceolate with conspicuously pectinate appendages. Flowers pink or purple. Achenes compressed. Pappus of copious, unequal bristles longer than the achene.

Dry plains. May-August. Common in southwestern part of state.



GLOSSARY

- Abortive organ**—An organ or part normal in the species but which has failed to reach full development in the individual.
- Acaulescent**—Without an aerial leafy stem.
- Accumbent**—Applied to cotyledons in the seed when lying against the hypocotyl.
- Achene**—A one-seeded dry indehiscent fruit with a tightly fitting pericarp around the seed.
- Actinomorphic**—Radially symmetrical; a flower or organ which can be cut into similar equal halves by two or more planes.
- Acuminate**—Tapering gradually to the apex.
- Acute**—Sharp pointed.
- Adelphous**—Having stamens united into groups or brotherhoods.
- Adnate**—United with a contiguous part; applied to an anther attached longitudinally to the end of the filament.
- Adventive**—Apparently becoming naturalized.
- Aggregate**—Clustered or massed together.
- Albumen**—Reserve food materials stored in a seed.
- Alliaceous**—Having the smell or taste of garlic.
- Alternate**—With a single leaf or other organ at each node.
- Alveolate**—Pitted like a honeycomb.
- Ament**—A slender, usually flexible spike of flowers, as in the willows.
- Amphibious**—Growing at times in the water, at others on the land.
- Amphitropous**—A partly inverted ovule.
- Analogous**—Organs or parts similar in function but not in origin and structure.
- Anastomosing**—Connecting so as to form a network.
- Anatropous**—An inverted ovule with the micropyle near the hilum.
- Andrecium**—The whole set of stamens in a flower.
- Angiospermous**—Having the seeds borne within a pericarp.
- Annual**—Yearly; living but one year.
- Anther**—The spore-bearing part of a stamen containing the microsporangia; the part which finally contains the pollen sacs.
- Anthesis**—The period of flowering.
- Anthocarp**—A utricular fruit surrounded by the persistent base of the perianth.
- Apetalous**—Without petals.
- Apical**—At the top.
- Apiculate**—Ending in a short, pointed tip.
- Appressed**—Lying close against another organ.
- Aquatic**—Living in the water.
- Aril**—A fleshy organ around the hilum or base of the ovule.
- Aristate**—Tipped by an awn or bristle.

- Articulate (teeth of peristome)—Marked by cross-bars.
Ascending—Growing obliquely upward.
Auricled, Auriculate—With ear-like lobes or appendages.
Awn—A slender bristle-like organ.
Axil—The point of a stem just above the base of the leaf.
Axile—In the axis of an organ.
Axillary bud—The bud in the axil of a leaf.
- Barbellate—With minute barbs.
Basal (scale) cells—Cells at the base or insertion of a moss scale.
Beak—The long point sometimes developed at the tip of the operculum of mosses.
Berry—A fruit with a fleshy or pulpy pericarp.
Biennial—Lasting two years.
Bifid—Two-parted.
Bifurcate—Forked into two branches.
Bilabiate—Two-lipped.
Bilocular (2-locular)—having two cavities.
Bi-pinnate—Twice pinnately compound.
Bi-pinnatifid—Twice pinnatifid.
Bisporangiate—Having both microsporangia and megasporangia; having both stamens and carpels.
Blade—The expanded part of a leaf.
Bloom—The white powdery layer on some plants.
Bract—A small, rudimentary, or imperfectly developed leaf.
Bracteate—Having bracts.
Bractlet—A secondary bract, as one upon the pedicel of a flower.
Bud scale—One of the scales in the winter bud of woody plants.
Bulb—A bud with fleshy bracts or scales, usually subterranean.
Bulblet—A small bulb, especially one borne upon the stem.
Bundle scar—A scar in a leaf scar produced by a vascular bundle.
- Caducous—Falling away very soon after development.
Cæspitose—Growing in tufts.
Calyx—The outer set of sterile floral leaves; the whole set of sepals.
Cambium—The cylinder of growing cells in some stems.
Campanulate—Bell-shaped.
Canescent—With gray or hoary fine pubescence.
Capitate—Arranged in a head.
Capsule—A dry fruit of two or more carpels usually dehiscent by valves or teeth. Sometimes applied to the sporangium of a bryophyte.
Carpel—The megasporophyll of a seed plant; the modified leaf bearing the ovules.
Carpellate—Having only carpels, or carpellate flowers.

- Caryopsis—The grain of fruit of grasses, with a thin pericarp adherent to the seed.
- Catkin—Same as ament.
- Caudate—Tailed; pointed like a tail.
- Caulescent—Having an evident stem.
- Cauline—Pertaining to the stems.
- Cell—The unit of plant and animal structure; usually consisting of a small mass of protoplasm containing a nucleus and with a cell wall.
- Chaff—Dry, thin scales.
- Chalaza—The base of an ovule.
- Chartaceous—Having the texture of paper or parchment.
- Chloroplasts—The minute, green, chlorophyll-bearing color bodies in the cells of a plant.
- Chlorophyll—The green coloring matter of plants.
- Choripetalous—Having the petals separate or free.
- Cilia—Slender protoplasmic lashes or projections extending from certain cells. Slender hair-like processes between the teeth of the peristome of a moss.
- Ciliate—Provided with marginal hairs; having cilia.
- Ciliolate—Minutely ciliate.
- Cinereous—Ash-colored; ashy.
- Circinate—Rolled inward from the apex.
- Circumscissile—Transversely dehiscent, the top falling off as a lid. developing from lateral archegonia.
- Clavate—Club-shaped.
- Claw—The narrowed base of certain petals.
- Cleft—Divided almost to the middle.
- Cleistogamous—Flowers which do not open and are pollinated from their own anthers.
- Complete flower—One having sepals, petals, stamens, and carpels.
- Compound—Composed of several parts or divisions.
- Compressed—Flattened laterally.
- Conduplicate—Folded lengthwise.
- Connate—United from the first.
- Convolute—Rolled around or rolled up longitudinally.
- Cordate—Heart-shaped.
- Coriaceous—Leathery.
- Corm—A swollen, fleshy, upright, geophilous stem.
- Corolla—The inner set of sterile, usually colored, floral leaves; the whole set of petals.
- Corona—An appendage of the corolla; a crown-like margin at the top of an organ.
- Corymb—A convex or flat-topped inflorescence of the racemose type.
- Corymbose—In corymbs, or corymb-like.
- Cotyledon—A leaf-like organ of the embryo in the seed.

Crenate—With rounded teeth.

Crenulate—Minutely crenate.

Creeping—Running along at or near the surface of the ground and rooting.

Crustaceous—Hard and brittle.

Cuculate—Hooded, or hood-shaped.

Cuneate—Wedge-shaped.

Cuspidate—With a sharp stiff point.

Cyathium—A cuplike inflorescence, as in the sparges.

Cyme—An inflorescence of the determinate type, the central flower developing first.

Cymose—Having cymes; or like cymes.

Deciduous—Falling away at the end of the growing period.

Decomound—More than once compound.

Decumbent—With an inclined position but the end ascending.

Decurrent—Applied to an organ extending along the sides of another.

Deflexed—Bent or turned abruptly downward.

Dehiscence—The opening of an ovulary, sporangium, or pollen sack for the discharge of the contents.

Dehiscent—Opening regularly by valves, slits, etc., as a capsule or anther.

Deliquescent—Dissolving or liquefying.

Deltoid—Broadly triangular.

Dentate—With outwardly projecting teeth.

Denticulate—Finely toothed.

Depressed—Somewhat flattened from above.

Determinate—Definite or fixed, as when a flower develops at the end of a stem.

Diadelphous—Having the stamens united into two sets.

Dichotomous—Two-forked.

Dicotyledonous—Having two cotyledons.

Di-dynamous—Applied to stamens when in two pairs of unequal length.

Diecious—Having the staminate flowers and the carpellate flowers on separate plants.

Diœcious—Same as diecious.

Diffuse—Loosely spreading.

Digitate—Diverging like the spread fingers.

Dimorphous—Of two forms.

Discoid—Resembling a disk.

Disk—A flattened enlargement of the receptacle of a flower or inflorescence; the head of tubular flowers in the sunflowers and related plants.

Dissected—Divided into many segments.

Distinct—Separate, not united.

Divaricate—Diverging at a wide angle.

Divided—Cleft to the base or to the midrib.

Dorsal—On the back or pertaining to the back.

Exserted—Extended beyond surrounding organs or parts; protruding.

Ex-stipulate—Without stipules.

Extrose—Facing outwards.

Falcate—Scythe-shaped.

Elliptical—Like an ellipse.

Emarginate—With a notched apex.

Embryo—An incipient plant especially in the seed.

Embryo sac—The female gametophyte, contained in the ovule of seed plants.

Endocarp—The inner layer of the pericarp.

Endosperm—The nourishing tissue developed around the embryo in the female gametophyte of the anthophyta.

Entire—Without teeth, serrations, or lobes.

Ephemeral—Containing for only a day or less.

Epigynous—Aduate to the surface of the ovary, so as to be apparently inserted upon the top of it;—said of stamens, petals, or sepals; and also of flowers whose parts are of this type.

Equitant—Straddling or folded around each other.

Erose—Margined as if gnawed.

Evanescent—Disappearing early.

Excurrent—With a tip projecting beyond the main part of the organ.

Exocarp—The outer layer of the pericarp.

Exserted—Extending beyond surrounding organs or parts; protruding.

Falcate.—Scythe-shaped.

Fascicled—Densely clustered.

Ferruginous—Resembling iron rust.

Fertile—Bearing spores, gametes, or seeds.

Fertilization—The conjugation of the male and female gametes.

Fetid—Ill-smelling.

Filament—The stalk of an anther; a thread-like chain of cells.

Filamentous—Thread-like.

Filiform—Like a filament.

Fimbriate—Fringed.

Fimbrillate—Minutely fringed.

Flaccid—Soft and weak.

Flexuous—Zigzag; Bending alternately from side to side.

Floccose—With loose tufts of wool-like hairs.

Flower—A determinate sporophyll-bearing shoot, or a modification of such a shoot; in the Anthophyta commonly with a perianth.

Foliaceous—Leaf-like.

Foliate—Having leaves; bi-foliate, two-leaved; tri-foliate, three-leaved.

Foliolate—Having leaflets.

Follicle—A simple fruit dehiscent along one suture.

Free—Not adnate to other organs.

Fruit—The ripe ovulary with the seeds and whatever parts are consolidated with it.

Fruiting—Bearing spores, seeds, or fruit.

Fruitcose—More or less shrub-like.

Fugaceous—Falling soon after development.

Funiculus—The little stalk by which the ovule or seed is attached to the placenta.

Funnel-form—Applied to corollas with a tube gradually enlarging from the base.

Fusiform—Spindle-shaped.

Gamopetalous—Having the petals of the corolla more or less united.

Genera—Plural of genus.

Genus—The smallest natural group containing distinct species.

Gibbons—Enlarged or swollen on one side.

Glabrate—nearly without hairs.

Glabrous—Covered with a bluish or white bloom.

Globose—Spherical or nearly so.

Glomerate—In a close or compact cluster.

Gregarious—Growing in groups.

Gynecium—The whole set of carpels in a flower.

Habit—General aspect.

Habitat—The place where a plant grows.

Halberd-shaped—Same as hastate.

Hastate—Arrow-shaped with the basal lobes diverging.

Head—A dense, round inflorescence of sessile or nearly sessile flowers.

Herbaceous—Leaf-like in texture and color.

Hermaphrodite—An individual having both male and female sexual organs.

Hilum—The scar on a seed where the funiculus was attached.

Hirsute—Having rather coarse, stiff hairs.

Hispid—With bristly, stiff hairs.

Hoary—Grayish with a fine pubescence.

Hyaline—Clear and translucent.

Hydrophyte—A water plant.

Hypanthium—Any enlargement or special development of the torus, in a flower, on which the sepals, petals, and stamens are borne; a perigynous or epigynous disk.

Hypogynous—Having the calyx, corolla, and andrecium below the gynecium.

Imbricated—Overlapping.

Imperfect—Monosporangiate flowers; having only stamens or only carpels.

Incised—Cut into sharp lobes.

Included—Not projecting beyond surrounding parts.

Incomplete—Wanting in one of the floral envelopes.

Incubous—Having the scales or leaves so placed that the upper part of each one covers the base of the scale or leaf next above it.

Incumbent—Said of cotyledons when reflexed so that the back of one lies against the hypocotyl.

Indehiscent—Not opening.

Indeterminate—Not definite, nor limited.

Indigenous—Native to the place.

Inferior—Situated or arising below other organs.

Inflated—Bladdery.

Inflexed—Turned inward.

Inflorescence—The flower cluster of a plant and its mode of arrangement.

Inserted—Attached to or growing out of.

Internode—Part of a stem between two successive nodes.

Introrse—Facing inwards.

Involucel—A secondary involucre.

Involucrate—Having an involucre.

Involucre—A whorl of bracts subtending a flower or flower cluster.

Involute—Rolled inwardly.

Irregular—A flower with one or more organs of a set unlike the others.

Keel—A projecting ridge.

Key—A winged fruit, such as the maple or ash.

Labiate—With a lip-like organ.

Laciniate—Cut into narrow segments or lobes.

Lanceolate—Lance-shaped.

Lateral bud—An axillary bud.

Lateral scale—A scale on the sides of an axis.

Latex—The milky sap of certain plants.

Leaf—An expansion arising from the axis or branch of a sporophyte, usually specialized to carry on the functions of photosynthesis and transpiration.

Leaflet—One of the divisions of a compound leaf.

Leaf scar—The scar or cicatrix formed where the petiole of a leaf separates from the stem or twig.

Legume—A simple, dry fruit dehiscent along both sutures.

Lemma—The outer of the two flowering glumes inclosing a grass flower.

Ligulate—Provided with or resembling a ligule; as a ligulate flower.

Ligule—A strap-shaped organ. A triangular or somewhat elongated stipule-like organ on the leaves of Isoetes and Selaginella.

Liliaceous—Lily-like.

Limb—The expanded part of a petal, sepal or sympetalous corolla.

Linear—A long and narrow organ with the sides nearly parallel.

Lip—Each of the upper and lower divisions of a bi-labiate corolla or calyx.

Lobed—Divided to about the middle or less.

Loment—A jointed legume.

Loculicidal—A capsule which splits longitudinally through the middle of the back of each cavity or component carpel.

Lunate—Crescent-shaped.

Lyrate—Pinnatifid with the terminal lobe the largest.

Marginate—Provided with a border or margin of distinct character.

Monadelphous—Stamens with united filaments.

Monecious—Having staminate and carpellate flowers on the same plant.

Monocotyledonous—Having one cotyledon.

Monœcious—Same as monecious.

Muricate—With sharp points or prickles.

Muriculate—Minutely muricate.

Mucronate—With a sharp abrupt point.

Mucronulate—Slightly mucronate.

Nectary—A nectar-secreting organ.

Node—The place where two internodes join, normally with a single leaf or more.

Nut—An indehiscent one-seeded fruit with a hard or bony peri-carp.

Nutlet—A very small nut.

Ob—A Latin prefix indicating inversion.

Obcordate—Inversely heart-shaped.

Oblanceolate—Inversely lanceolate.

Oblique—Unequal-sided or slanting.

Oblong—Somewhat longer than broad with the sides nearly parallel.

Obovate—Inversely ovate.

Obsolete—Not evident; rudimentary.

Obtuse—Blunt or rounded at the end.

Ochreæ—The sheathing united stipules of *Polygonaceae*.

- Oddly pinnate—Pinnately compound and having a terminal leaflet.
- Orbicular—Nearly circular in outline.
- Orthotropous—A straight ovule, having the hilum and micropyle at opposite ends.
- Oval—Broadly elliptic.
- Ovary—The female organ of reproduction; an egg-producing organ.
- Ovate—Shaped like the longitudinal section of a hen's egg.
- Ovule—The megasporangium of a seed plant which later develops into a seed.
- Palmate—Diverging like the fingers of a hand.
- Panicle—A compound inflorescence of the racemose type usually of pyramidal form.
- Paniculate—Borne in a panicle; resembling a panicle.
- Papilionaceous—Applied to the zygomorphic flowers of the Bean family.
- Papillose—With minute blunt projections.
- Pappus—The bristles, awns, teeth, etc., on the top of an achene.
- Parietal—Borne on the wall of the ovulary, or pertaining to it.
- Parted—Deeply cleft.
- Pedicel—The stalk of a flower in a flower-cluster.
- Peduncle—The stalk of a flower or flower-cluster.
- Peltate—Shield-shaped, as a leaf with the petiole attached at or near the centre of the blade.
- Pendulous—Applied to an ovule which hangs downward from the side of the ovary.
- Pepo—A fruit with a hard outer rind, as a gourd or melon.
- Perennial—Growing for many years.
- Perfect—A flower having both stamens and carpels.
- Perfoliate—Leaves so clasping the stem as to appear as if pierced by it.
- Perianth—The calyx and corolla taken collectively.
- Pericarp—The wall of a fruit; the carpel wall.
- Perigynous—Having the sepals, petals and stamens borne on a disk or hypanthium surrounding the gynecium.
- Persistent—Remaining attached after the growing period.
- Petal—One of the leaves of the corolla.
- Petiole—The stalk of a leaf.
- Pilose—With long soft hairs.
- Pinna—The primary division of a pinnately-compound leaf.
- Pinnate—Leaves divided into leaflets or segments along a common axis.
- Pinnatifid—Pinnately cleft to the middle or beyond.
- Pinnule—A division of a pinna in a compound leaf.
- Pistil—The seed-bearing organ of the flower, consisting of the ovary, stigma, and style when present.

Pistillate—Having pistils, and destitute of stamens.

Pitted—Marked with small depressions or pits.

Placenta—The ridge or surface bearing the ovules.

Plicate—Folded like a fan.

Plumose—Resembling a plume or feather.

Plumule—The stem tip or bud of the embryo in a seed.

Pollen grain—The male gametophyte of seed plants.

Polygamous—Having perfect and uni-sexual flowers on the same individual, or on different individuals of the same species.

Polypetalous—Having several separate petals.

Pome—A fruit with a fleshy perigynous disk adnate to the ovulary, as in the apples.

Prickle—A stiff sharp-pointed outgrowth from the epidermis.

Procumbent—Lying on the ground.

Prostrate—Lying flat upon the ground.

Puberulent—With very short hairs.

Pubescent—Hairy, especially with fine and soft hairs.

Punctate—With translucent dots or glands.

Raceme—An elongated inflorescence with each flower on a peduncle.

Racemose—Like a raceme, or in a raceme.

Rachis—The axis of a compound leaf, spike, or raceme.

Radiate—Radiating; with ray-flowers.

Ray—A marginal strap-shaped corolla as in the sunflower.

Receptacle—The end of the flower stalk bearing the floral organs.

Reflexed—Bent backward abruptly.

Regular—Having the parts of each set alike in size and shape.

Reniform—Kidney-shaped.

Repand—With a more or less wavy margin.

Reticulate—Arranged as a network.

Retorse—Directed downward or backward.

Retuse—With a shallow notch at the end.

Revolute—Rolled backward.

Rhizome—An underground stem.

Rootstock—A rhizome.

Rostrate—With a beak.

Rotate—With a flat round corolla; wheel-shaped.

Rugose—Wrinkled.

Runcinate—Sharply and coarsely pinnatifid with the lobes turned backward.

Runner—A prostrate lateral offshoot rooting at the nodes.

Sagittate—Shaped like an arrow head.

Salver-form—Applied to a corolla with a border spreading at right angles to the tube.

Saccate—Sac-shaped.

Samara—A simple indehiscent winged fruit.

Scabrous—Rough.

Scale—A highly modified dry leaf as in a winter bud; also the fleshy leaf bases or leaves of a bulb; a flat more or less membranous outgrowth from a leaf or stem. The leaf-like expansions on the gametophytes of mosses and liverworts.

Scape—A leafless or nearly leafless stem, coming from an underground part and bearing a flower or flower cluster.

Scapose—Having scapes or resembling scapes.

Scorpioid—Having the axis of the inflorescence coiled to one side.

Scurfy—Covered with scurf, minute membranous scales, as in *Chenopodium*.

Scarious—Thin, dry, and translucent, not green.

Secund—Twisted or turned to one side.

Seed—The matured and modified ovule with a dormant embryo.

Segment—A division of a compound leaf or of a perianth.

Sepal—One of the leaves of a calyx.

Septicidal—A capsule which splits longitudinally through its partitions, thus dividing it into component carpels.

Serrate—With teeth projecting forward.

Serrulate—Finely serrate.

Sessile—Without a stalk.

Seta—The stem or stalk of a moss sporophyte.

Setaceous—Bristle-like.

Silicle—A silique not much longer than wide.

Silique—An elongated two-valved capsular fruit with two parietal placentæ.

Sinuate—With strongly wavy margins.

Sinus—The space between two lobes.

Spadix—A fleshy spike-like inflorescence.

Spathe—A bract subtending a spadix as in the Aroids.

Spatulate—Widened at the top like a spatula.

Spicate—Resembling a spike.

Spike—An elongated inflorescence with sessile or nearly sessile flowers.

Spikelet—A small spike; especially the ultimate flower-cluster of the inflorescence of grasses and sedges.

Spine—A short thorn-like organ representing a leaf or part of a leaf in origin, as the spines on the leaves of the Christmas holly.

Spinose—Beset with spines.

Spinulose—With small sharp spines.

Spreading—Diverging and nearly prostrate.

Spur—A hollow projection from a floral organ. A short stunted branch, not a thorn or a dwarf branch.

Squarrose—With spreading or projecting parts.

- Stamen**—The organ of a flower which produces microsporangia, which contain the microspores which later develop into pollen grains; a microsporophyll.
- Staminodium**—A sterile stamen, or any structure without anther corresponding to a stamen.
- Staminate**—Having only stamens or staminate flowers.
- Standard**—The upper, usually broad petal of a papilionaceous flower.
- Stellate**—Star-shaped.
- Sterile**—Not producing spores or seeds.
- Stigma**—The upper part of the carpel; a special organ of the Angiosperms to catch the pollen grains.
- Stipe**—The stalk-like support of a pistil.
- Stipel**—The stipule of a leaflet.
- Stipitate**—Having a stipe.
- Stipular scar**—The mark made on the bark by deciduous stipules.
- Stipular spine**—A spine representing a stipule or having the position of a stipule.
- Stipules**—Bract-like appendages at the base of the petiole of many leaves.
- Stipulate**—Having stipules.
- Stolon**—A basal branch rooting at the nodes.
- Stoloniferous**—Bearing stolons.
- Stoma (Pl. stomata)**—The transpiring pores in the epidermis of the higher plants.
- Striate**—Marked with fine longitudinal lines or ridges.
- Strigose**—With stiff appressed or ascending hairs.
- Style**—The narrow top of the carpel or united carpels between the ovulary and stigma.
- Sub-acute**—Somewhat acute.
- Subcordate**—Somewhat heart-shaped.
- Subcoriaceous**—Somewhat coriaceous.
- Submerged**—Growing under water.
- Subulate**—Awl-shaped.
- Succulent**—Soft and juicy.
- Sulcate**—With a longitudinal groove.
- Superior**—Above.
- Suture**—A line of dehiscence.
- Sympetalous**—With petals more or less united.
- Syncarp**—A fleshy aggregate fruit.
- Syngenesious**—Said of stamens which are united by their anthers.
- Tendrill**—A slender coiling organ.
- Terete**—Circular in cross section.
- Ternate**—Divided into three segments; arranged in threes.
- Terrestrial**—Growing on the ground, not in the water.
- Tetradynamous**—With four long stamens and two short ones as in the cruciferae.

- Tetramerous**—Four-parted.
- Thorn**—A highly modified sharp-pointed branch.
- Thorn-like spur**—A short stunted branch ending in a sharp point or thorn.
- Thyrus**—A dense panicle.
- Tomentose**—Covered with dense wool-like hairs.
- Tooth (of peristome)**—One of the segments or parts of the peristome of a moss.
- Toothed**—Dentate.
- Torus**—The upper end of the peduncle which supports the floral organs.
- Triadelphous**—Having stamens united by their filaments into three bundles.
- Trifoliate**—A compound leaf with three leaflets.
- Trimerous**—Three-parted.
- Truncate**—Terminating abruptly by a nearly straight edge or surface.
- Tuber**—A thick short geophilous branch or part of a branch.
- Tubercle**—A small tuber or a wart-like projection; the persistent base of the style in some sedges.
- Tufted**—Growing in clusters or clumps.
- Turbinate**—Top-shaped.
- Two-ranked**—Disposed in two vertical rows along the twig; with the third leaf in line with the first.
- Umbel**—A determinate inflorescence with all the pedicles arising from the same point.
- Umbellate**—In an umbel or like an umbel.
- Undulate**—With wavy margins.
- Uni-sexual**—Having only ovaries or spermaries on one individual.
- Utricle**—A one-seeded fruit with a loose pericarp.
- Valvate**—Meeting by the margins in the bud, not overlapping; dehiscent by valves.
- Valve**—One of the parts into which a dehiscent capsule splits.
- Vascular bundle**—The conducting strands in the plant body composed of wood and bast in which water and food materials are conducted through the roots, stems, and leaves.
- Vein**—One of the branches of the vascular portion of leaves or other organs.
- Venation**—The arrangement of the veins.
- Vernation**—The arrangement of the leaves in the bud.
- Versatile**—An anther attached at or near its middle to the filament.
- Verticillate**—Whorled.
- Villous**—With long soft hairs not matted together.
- Viscid**—Glutinous; sticky.
- Whorl**—An arrangement of leaves, etc., in a circle round the stem,

Whorled—A group of three or more similar organs radiating from a node.

Winged—With a thin expansion.

Woolly—Clothed with long, coiled, or matted hairs.

Xerophyte—A plant adapted to desert conditions.

Zygomorphic—A flower or organ which can be cut into similar halves by only one plane.

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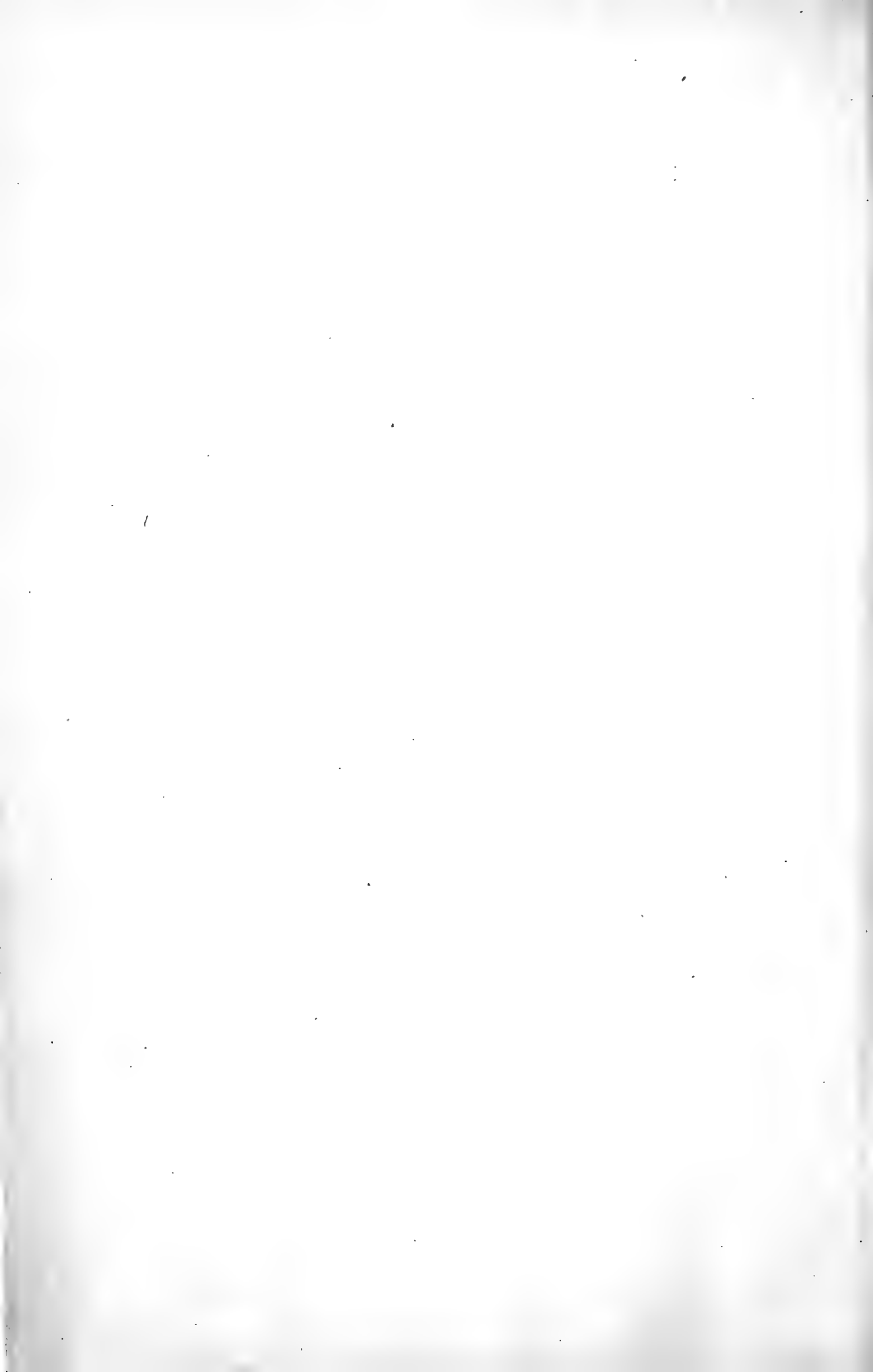
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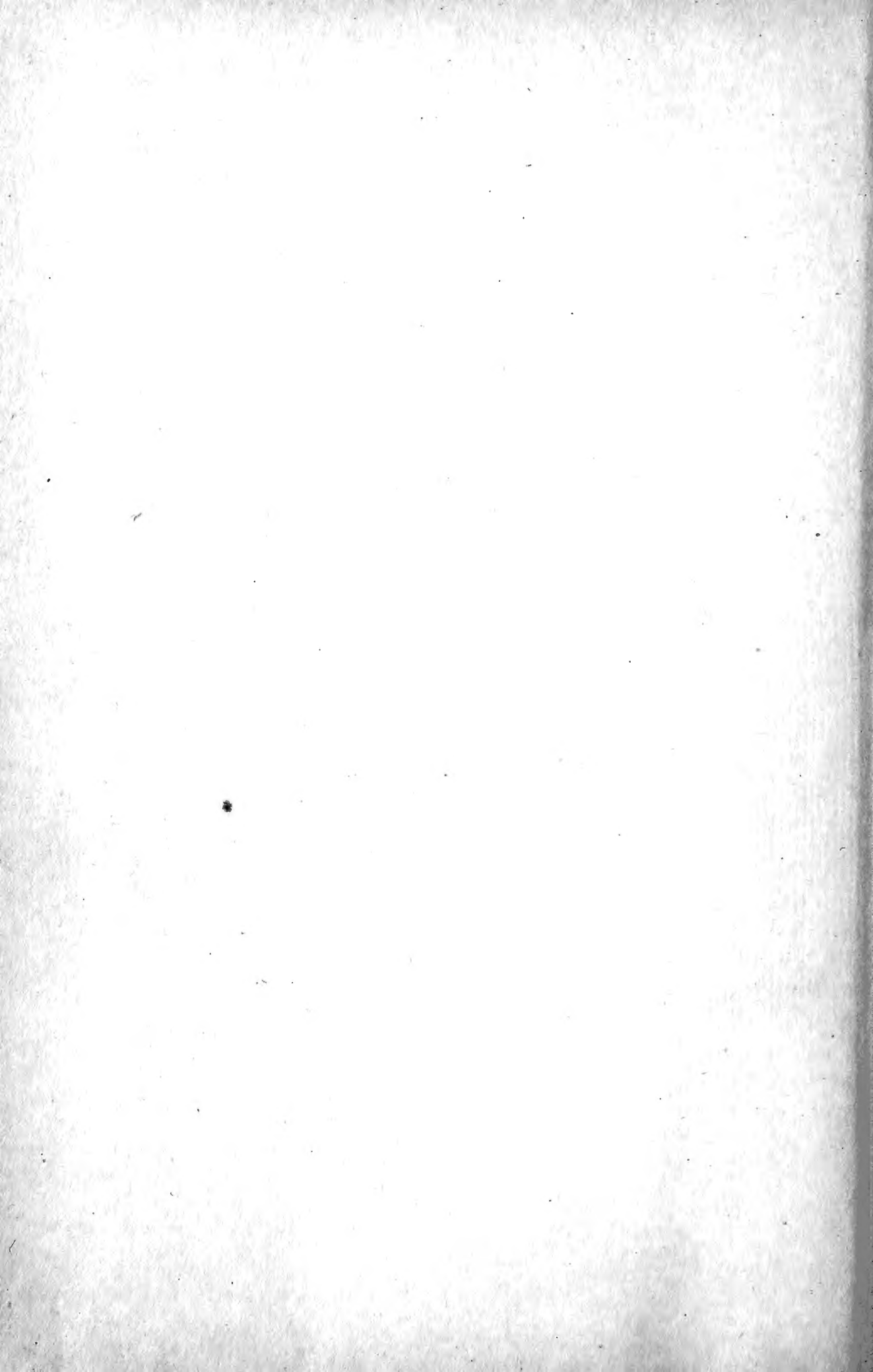
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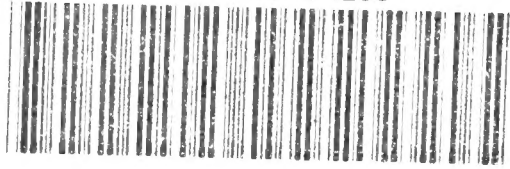
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